The Teaching of Orthopedic Dentistry.

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Junior Technics.

Realizing, a number of years ago, that college classes in the technics of orthodontia under my direction were obliged to spend too much time on the preliminary work of constructing stock material and implements, and consequently not enough time on the more advanced stages of the technic work that are indispensable to advanced practice in this branch of dentistry, I have for several years put into practice the following rules, with the most marked improvement in the practical training of students:

First—That students should be taught in the technics of orthodontia only that which will be useful to them in actual practice.

Second—That the junior students shall be thoroughly trained in that portion of the technics which they may be called upon to practically apply in their senior infirmary practice.

Third—That the technic work of the class should be thoroughly systematized and pursued along practical lines, and consist in no more work than each student can easily and perfectly perform in two half days of each week for three months.

Fourth—That the principal portion of the technic work shall consist in the construction of practical finished material and appliances to be pre-

sented for grade markings, and become a part of the college stock material for the construction of practical regulating apparatuses in the infirmary practice.

In my opinion, technic students should be drilled in correct methods of obtaining plaster models for study, etc., the separating and measuring of natural teeth for bands, the soldering of bands and their various force attachments, the construction of movable and stationary anchorages, the uses of the draw and screw-plates for the drawing of wire and tubing and the threading of wires and nuts, the threading and tempering of taps, the construction of wrenches and unattached appliances, such as alignment bows, screw-jacks, etc., and the final finishing and plating of appliances.

In my teaching I have abandoned the requirement that students shall roll banding material, because of the meagre facilities for properly performing the work and the time consumed in the attempt, but principally because they will rarely prepare it in practice. The same is true of a large proportion of the other material which we now furnish to the students in a partially prepared state, requiring them to do only that portion of its completion that they would be called upon to perform in practice. The wire and part of the tubing they draw is only to train them in the use of the draw-plate, and is not considered as belonging to the stock, because, unless the wire is drawn through a specially prepared draw-plate, in all probability it will not be the proper sizes for threading in the screw-plate, and, moreover, it would require the frequent use of a micrometer gauge, which students will not buy, to determine and classify the sizes.

Believing that students should be thoroughly trained in the construction of different kinds of regulating bands, fully finished with attachments, that they may be called upon to construct for the regulation of teeth, the technic branch of this work contains all of the kinds that are used for different apparatuses, with full illustrations and descriptions of each. The teacher is expected to select and make chart drawings of the kinds which he wishes his class to make, and to divide the class alphabetically into sections, requiring each student to make at least twelve creditable bands for different teeth.

I would advise that students be required to take the band measurement of the *natural* teeth of the fellow used for the impression. In those cases where this is not possible, a technic rubber model can be submitted. The practical advantage to the student over the ordinary way of allowing them to take the measurements from the plaster models or dummies is quite as marked as it would be in other departments if students could not be supplied with practical infirmary cases, as too frequently occurs in this department. Occasionally, a student will object to the operation, claiming that separating will injure his teeth. But those who have the slightest interest

in the advancement of their fellows or themselves will willingly submit to the unpleasantness; for that it all it amounts to.

The threading and finishing of blank taps, nuts and wires that are furnished to the class in accurate sizes, and the construction of a few kinds of jack and traction screws, will give to the student all the training necessary in this line.

Instead of requiring the student to construct the usual stereotyped regulating apparatus, with training limited to the demand of a few simple irregularities, appliances are now constructed by the entire class with training distributed so as to apply to nearly all characters of irregularity.

If the work is pursued, as it should be, along purely practical lines, it will offer to the student a far more thorough system of training for final practice, with less difficulties and time expended, than has been possible by a regime that requires the complete construction of implements and appliances and a final "show-up" apparatus from the crude material.

True success in teaching every branch of orthodontia which pertains to the construction and action of appliances, whether in practical or didactic instruction, will never be attained without the adoption of some standard system of sizes and the use of a screw-plate that will properly thread the few sizes of wire we require for the work. Then a large proportion of that which we use, or wish to refer to in our teaching, can be numbered the same as the wire for which it is constructed to fit.

In a paper presented at the meeting of this society in 1899 this principle of teaching was advocated, and I am pleased to say that it is now made absolutely practical by the use of the New Standard screw-plate. Heretofore, we have been obliged to draw wires that could be properly threaded in the screw-plates that students would purchase, the most popular of which has been the Martin; and as most of the sizes of the screw-cutting holes in these plates are either a few thousandths of an inch too large or too small to properly thread standard sizes of wire, students and dentists who attempted to make regulating appliances were obliged to redraw commercial wire through a specially prepared draw-plate that was adapted to the requirements of the screw-plate or screw-dies, which they happened to possess. In college work this required the use of an expensive micrometer gauge and a perfect knowledge of the exact sizes they required, a process that could only be determined by the skill of an expert for each of the various kinds of plates in the class, besides many other difficult and almost insurmountable complications.

In the teaching which I propose, the sizes or thicknesses of wire, blank taps, plate, banding material, and the wall thicknesses of tubing, will be recognized as the American (B & S) Standard Gauge sizes; whereas, tubing, screw-plate holes, taps, blank nuts, nuts and wrenches, will take their

size numbers from the respective sizes of wire they are intended to be used with. For instance, a No. 18 wire can be perfectly threaded in a No. 18 hole of the Standard screw-plate; a No. 18 blank tap can be threaded in the same hole to make a No. 18 tap with which a No. 18 blank nut can be threaded to make a No. 18 nut, etc.

When it becomes necessary to speak of any of the above material in our teaching, the mere mention of name and number conveys at once an intelligent idea. Students soon become familiar with the few sizes required for the different appliances, and have a far more intelligent appreciation of the work in its several branches.

Nomenclature. A correct use of terms that could be universally adopted is greatly to be desired in this department of dentistry. At present we are hampered by the use of wrong or ill-chosen terms, which we are often constrained to cling to because of general usage. Again we are unhappily mystified by the ill-advised use of terms which certain prominent writers have adopted in their effort to find works that would more clearly and concisely express their meaning, and also perhaps to simplify that which should be more specifically and scientifically defined.

I would respectfully submit the following terms, with the hope that they will receive your consideration and adoption at this meeting as the standard expressions in this department of dentistry:

Irregularity. The terms irregular and irregularity, refer to teeth that are in malposition in relation to the normal alignment, occlusion, or esthetic contours of the physiognomy.

Alignment. Teeth are in alignment when they are in proper relation to the line of their dental arch. A tooth or teeth in malignment constitutes an irregularity; yet all the teeth of the dental arch may be in perfect alignment and also irregular, as instanced by abnormal protrusions of the upper, and other conditions.

Occlusion. The terms occlusion and malocclusion refer solely —as in other departments of dentistry—to the occlusion of the teeth, one upon the other. When the teeth are in malocclusion, it certainly constitutes an irregularity; yet in many cases of decided irregularity, the teeth are not necessarily in malocclusion, as in well shown in full protrusions and full retrusions of the upper and lower teeth.

Therefore the terms malocclusion and malalignment when used, as they are by some writers, in place of the terms: "Irregularities of the Teeth," "Orthodontia," or "Orthopedic Dentistry," are ill-advised.

Mesial and Distal.

Mesial and distal when used to define malposition, occlusion, movement, etc., will be used only in the sense in which they were originally intended to be used in dentistry, i. e., toward or from the median line, in a direction along the line of the dental arch. Therefore they should not be used, as they frequently are, in the sense of anterior and posterior, front or back, or protruded and retruded. If "the upper first molars occlude mesially to normal in their relations to the lowers," this irregularity should not be defined as one "in mesial occlusion" and vice-versa, because occlusion is a word which has reference to the lower teeth as well as the upper in occlusal contact; therefore, the irregularity might as well be defined as one in distal occlusion. Again: The mesio-distal relation of the molar occlusion in no sense defines the real irregularity, because this relation does not necessarily indicate that the upper teeth are protruded or retruded, for the fault may be entirely with the lowers; or it may be partly with the lowers and partly with the uppers, etc. The real irregularity in these conditions can only be determined and defined by a careful study of the position of the teeth in relation to the features of the physiogomy.

Arch.

The dental arch is that inscribed by the teeth. The *alveolar arch,* that inscribed by the alveolar process and overlying gum.

Zone.

Zone is a favorable word for locating sections of the dental and alveolar arches that we frequently wish to refer to in describing different characters of general malpositions and movements; as, occlusal or incisal zone, gingival zone, and apical zone.

Compound Terms.

The adjectives, *mesial, distal, labial, buccal, lingual, occlusal,* and their combinations, can be happily used to exactly define certain malpositions, movements, points of attachment, direction, etc.

The direction in which a tooth is mal-turned or rotated may be perfectly defined with a compound word if it is understood that the first member of the term refers to the surface of the tooth and the second to the direction of its malposition or movement. Thus, teeth are mal-turned, rotated, or require to be rotated, linguo-mesially or linguo-distally. Again, a tooth may be in mesial, distal, labial, buccal or lingual *inclination,* or in labial, buccal, or lingual *malalignment,* etc., etc. The malposition of an upper left lateral incisor that is said to be mesio-labially inclined, linguo-mesially mal-turned, and in labial malalignment, is not difficult to see "in the mind's eye."

Anterior and Posterior.

Anterior and posterior are words that are so well established by common usage, that it would be difficult if not impossible to drop them wholly from our nomenclature, as much as we would wish to. When used to define relative position or movement in a direction parallel to the median line of the dome, they are frequently of great advantage. In referring to general relations, it is far more sensible to say the "anterior-posterior relation" of the upper and lower sets of teeth than the "disto-mesial relation," because the latter words could refer only to the molars or biscuspids in the direction of front and back; though if wishing to refer only to the relation of the buccal teeth, the term "mesio-distal relation" would be preferable.

Protrude and Retrude.

The syllable "trude" (from trudo, to thrust) with certain prefixes, as Pro (forward), Re (back), Ex (out from), In (into), and Con (in upon), gives us a class of words of distinct and scientific meanings. Teeth are protruded or retruded only in respect to their normal facial relations, and in no instance can this be determined by the occlusal relation, as some writers imply.

Extrude and Intrude.

Extrude and intrude apply to teeth which are not in proper relation to the normal occlusal plane, and commonly spoken of as teeth that are too long or too short. The terms will be used particularly to define malposition of one or more teeth whose occlusal surfaces or incisal edges are not normally even with those of their adjoining fellows. When the condition involves all the front teeth, it will of course constitute an "open or close bite irregularity" though correction may be properly defined as the partial intrusion or extrusion of these teeth.

It is frequently desirable to speak of the six front upper or lower teeth as having moved or requiring movement, in phalanx; the same is true of the right and left upper and lower side teeth; therefore the term, *"Labial Teeth"* may be used to refer to the incisors and cuspids in single phalanx; and "Buccal Teeth" to the bicuspids and molars in single phalanx.

In referring to the general location of teeth, would it not be decidedly advisable to say *front* or *back* teeth instead of anterior or posterior teeth; and *upper* or *lower* teeth, instead of superior and inferior teeth?

Mal-turned and Rotate.

When a tooth is abnormally turned on its long axis it is "mal-turned." The term "rotate" and its suffixes refers preferably to the act or need of turning it.

ORTHODONTIA

Classification.

The teaching of the department of orthodontia has been especially difficult because of the almost limitless variety of malpositions which irregularities of the teeth present, and particularly because irregularities of the teeth have never been systematically nor scientifically grouped so that one could talk or even think of them as belonging to a class or type that required a certain order of treatment, or that differed from other classes because of certain recurring important variations, or that produced a certain facial deformity of effect, that differed from others whose teeth seemed to be in the same relative position.

In my opinion it is unfortunate that the last two text books written upon orthodontia place all irregularities of the teeth in three classes, divided and grouped according to the disto-mesial occlusion of the first permanent molars. That is to say; all irregularities of whatever character which occur with the molar occlusion typically normal are placed in one class; those which occur with the upper first molars occluding mesially to normal in relation to the lower, and *vice-versa,* are placed in the second and third classes respectively.

At the last meeting of the Illinois State Dental Society, I was constrained to present my opinion of this method of classification; and in detail I explained how the first class selected upon the basis of a typically normal molar occlusion must of necessity contain five distinct varieties of general irregularity, which differed in almost every respect from each other. I also claimed on that occasion, that the second and third classes, if grouped on the basis of the above conditions, would be found equally faulty when considered in the light of a classification designed for the information and practical advantage of students and busy practitioners.

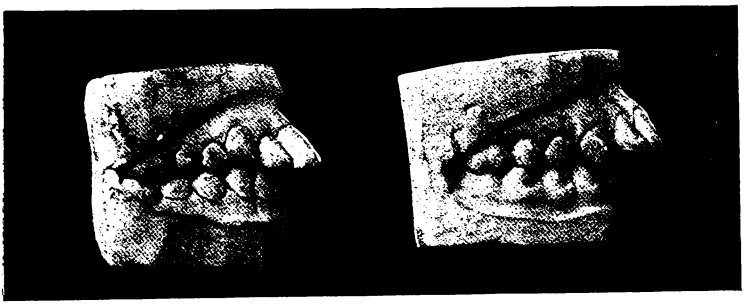
To more fully illustrate the purposes of this paper, which is purely a discussion of the choice of methods of teaching, and to not repeat that which has already been published, I will take the liberty of showing the different distinct types of irregularity of the teeth which we would be obliged to place in the second class, grouped on the basis of the upper molars occluding mesially to normal in relation to the lowers.

These constitute seven common irregularities that are distinctly different from each other, both as to their relation compared to the normally esthetic, and the movement which they demand for correction.

In going into this branch of the subject I trust that it will not be considered solely in the sense of a criticism. I introduce my views mainly to illustrate the principles I shall propose, which should govern classification, fully conscious that the advancement of every science has always been through a pathway of errors and that we should look upon them only as stepping stones to our progress.

To show how impossible it is to determine the real character of an irregularity of the teeth as a guide to treatment by the relations which the upper and lower teeth bear to each other, I will ask you to glance at the lantern projections of five cases from practice. (See Fig. 1.)

If you had the plaster models of these cases for careful examination, you would say they are very like each other in all general relations; the same apparent protrusion of the uppers in relation to the lowers; the same disto-mesial relation of the first molars—the upper standing about the width of a biscupid in front of a typically normal occlusion with the lower.



Case 1. Case 2.

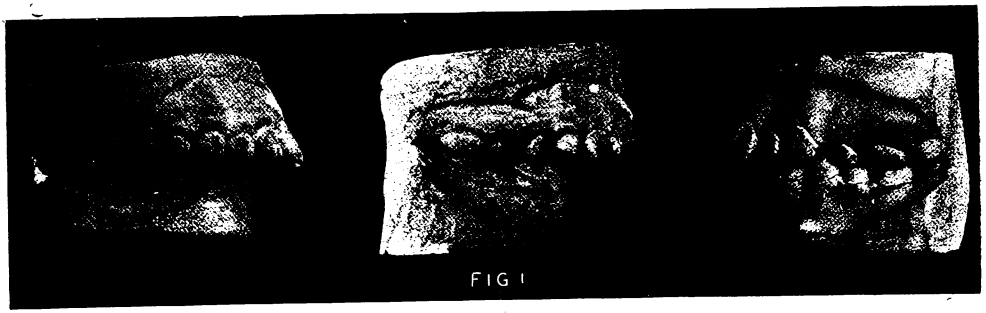


FIG 1

Case 3. Case 4. Case 5.

Perhaps you will notice that in some of the cases the teeth are more labially inclined than those of the others, but this often occurs in two cases of the same facial deformity because of the unequal thickness of disposition of the overlying tissues which aids in characterizing the facial contours; with the same argument you might notice that there is a slight but noticeable difference in the occlusion of some of the cases; and yet if they produce the same facial deformity I claim they should be placed in the same class, because the movement required for their correction and

the particular force which the regulating apparatus should exert would be practically the same. (See Fig. 2.) It happens that these cases to which I have called your attention belong to five distinctively different types of facial deformities, requiring for their correction decidedly different movements of the teeth and consequently different orders of force apparatuses.

Taking them up in detail: The *first* (See Fig. 3) is the most common form of upper protrusions, which require for their correction a retrusion of the crowns of the six upper front teeth.

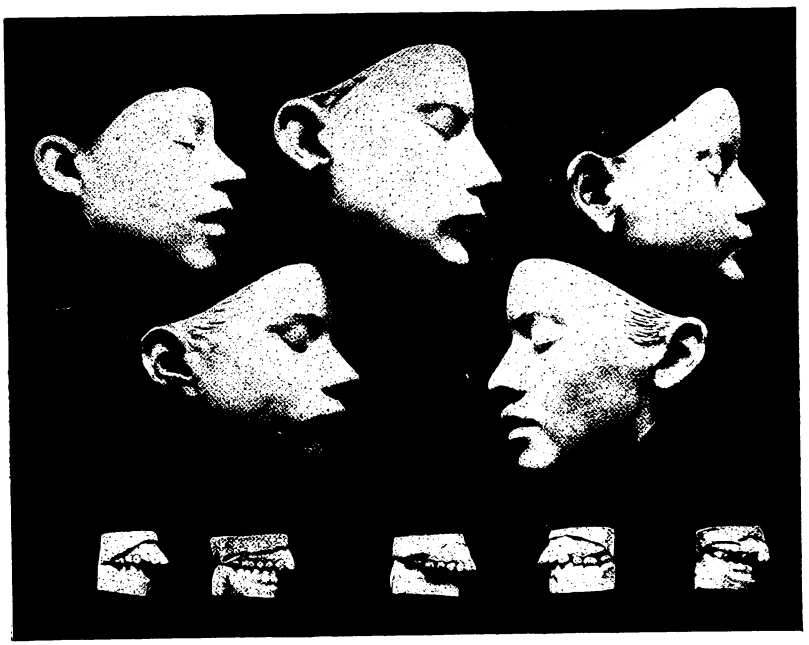


Fig. 2.

The *second* (See Fig. 4) differs from the first in that the roots of the front teeth are also protruded, producing a greater prominence or bulginess along the upper part of the upper lip and around the wings and nostrils of the nose. These cases require for their perfect correction the retrusion of the roots as well as the crowns; an operation that can only be successfully accomplished with a specially constructed apparatus that is entirely different from that required in the first form. Notice, if you please, the intermediate stage of the operation. Up to the time when these intermediate models were made, the patient had been wearing an apparatus

which applied a single force near to the gingival margins of the teeth, with the view of distributing the movement to the roots, or as much as it is possible to do so with force applied at a single point upon the crown. And yet we can see, with the crowns alone retruded, that the protrusion over the apical zone is even more marked than it was at first. The final re-

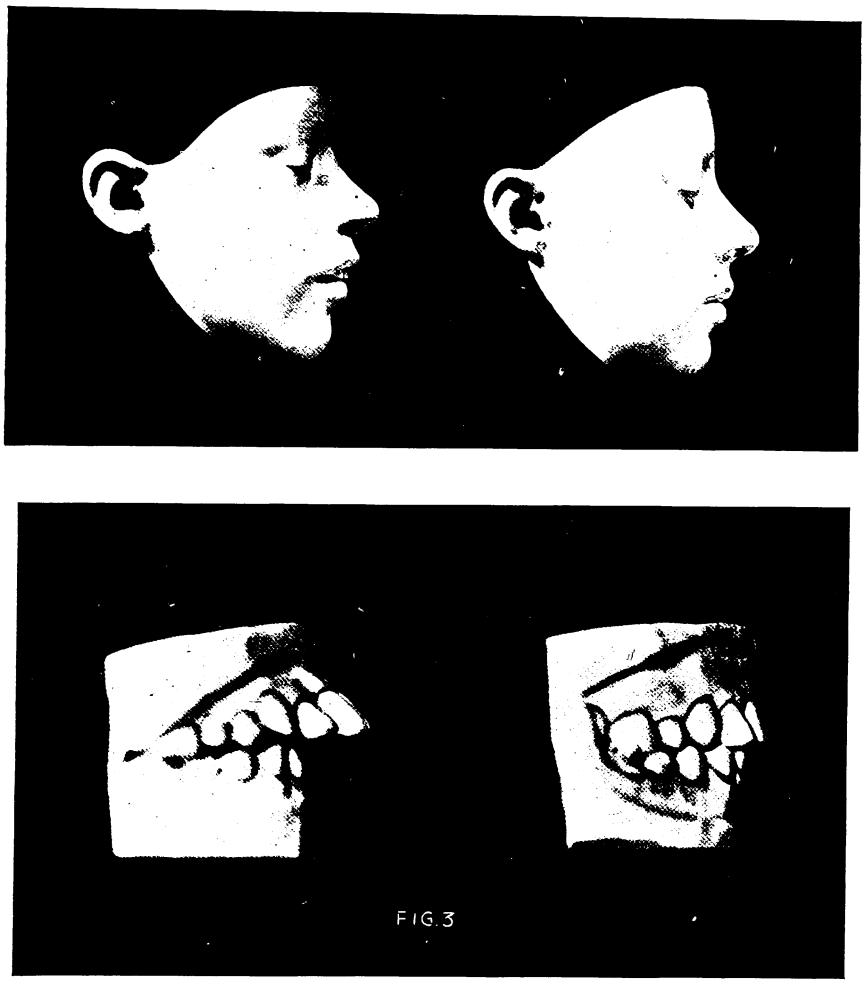


FIG. 3

sult, shown by the models on the right, was obtained with an apparatus specially designed for retruding the apical zone of the incisor teeth, which, as will be seen, reduced the unpleasant prominence along the upper part of the upper lip.

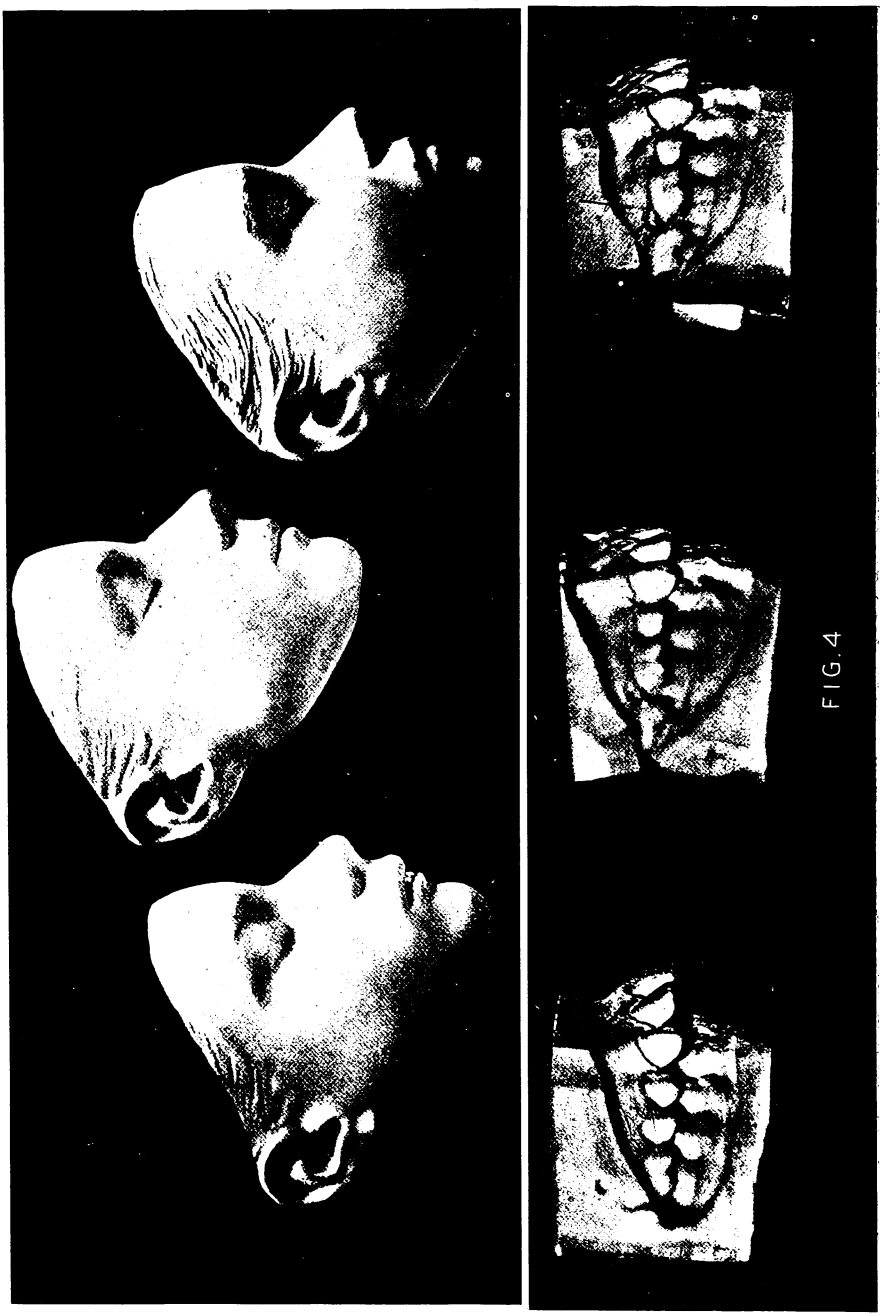
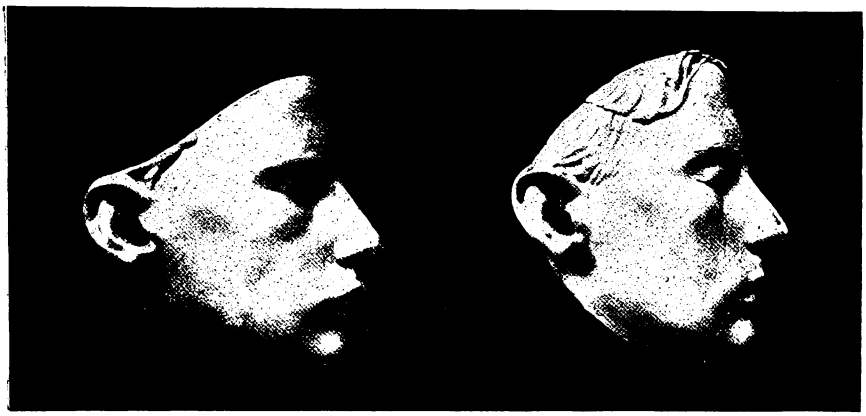


FIG. 4

The *Third* (See Fig. 5) is a protrusion of the upper teeth, and a retrusion of the lower, another marked differentiation in character and demands.

The *Fourth* (See Fig. 6) is a retrusion of the lower teeth, with the upper normal; a not uncommon irregularity that is widely different from the first in which the upper alone was protruded.



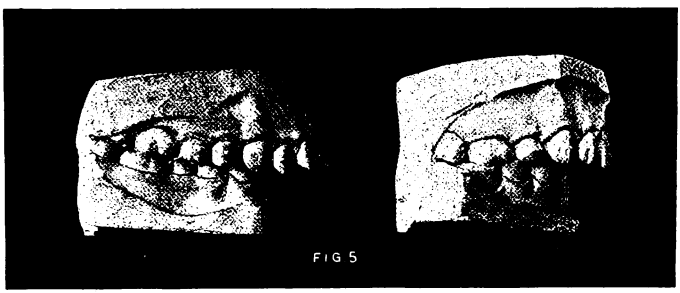


FIG 5

The *Fifth* (See Fig. 7) is a compound irregularity, which in its most marked form produces a depression along the upper part of the upper lip, with a deepening of the naso-labial lines and a protrusion of the lower part of the upper lip. In these cases the general inclination of the uppers may differ somewhat without changing the peculiar characteristics of the class, which are: a retrusion of the apical zone and a protrusion of the occlusal, demanding an apparatus that will protrude the roots and retrude the crowns, or the protruding contour apparatus, with a movement that is entirely different in its demands and action from either of the others.

It is not presumed that these marked characteristics will always be found in the pronounced forms of the cases I have shown, but in all varying degrees in the antero-Posterior relation of the upper to the lower teeth, and also to the unchangeable features of the physiognomy. In other words, the peculiar characteristics which I claim constitute a class may be found merging into that of another class, requiring an intelligent appreciation of the real condition and demands of treatment that cannot be

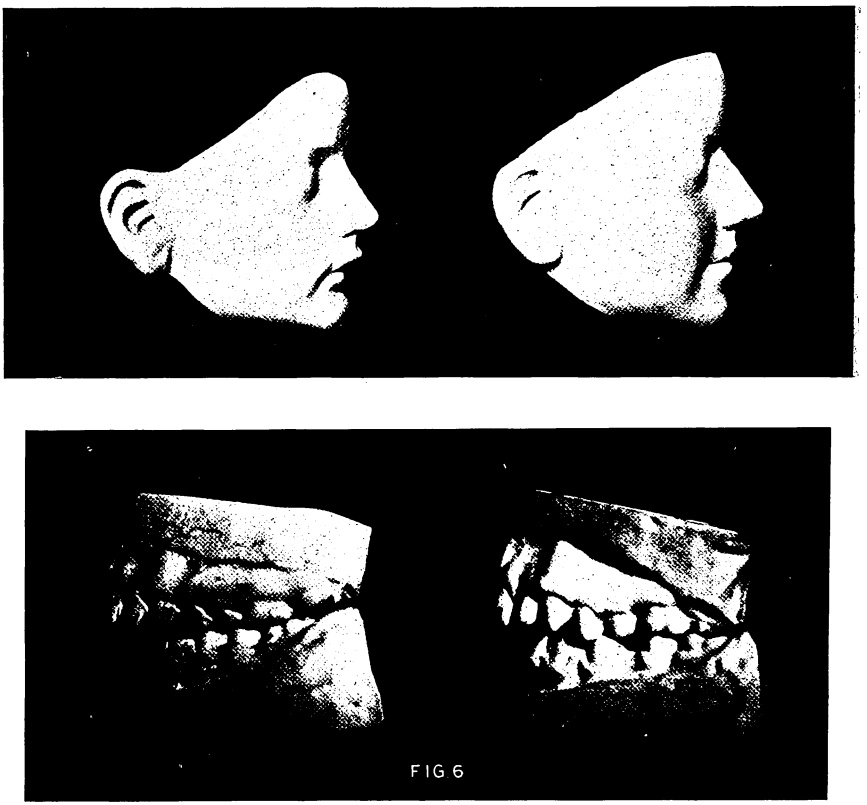


FIG 6

gauged by cut and dried rules. It seems to me, however, of eminent advantage, especially in our teaching, to have these division guide-posts of class characteristics to work to or from, instead of placing distinctively different irregularities in one class because they happen to be alike in the single particular of molar occlusion; especially as this tells us nothing of the real condition, nor points the way to its correction.

The *Sixth* (See Fig. 8) typical character with the same occlusion of the first permanent molars, is the inherited bodily retrusion of the lower

teeth and jaw, and facially characterized by a retruded chin. These cases demand for their perfect correction the operation which Dr. Kingsley has so aptly named, "jumping the bite." In the typical form they are very rare in my practice, as this deformity is nearly always accompanied with

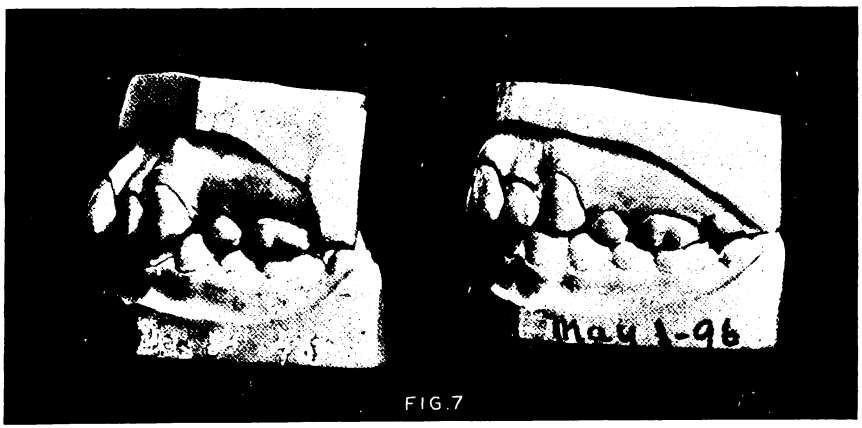


FIG. 7

more or less protrusion of the uppers, as shown by the illustration, which was partially corrected, as will be seen, by the retrusion of the upper teeth.

The *Seventh* (See Fig. 9) and last irregularity to which I shall call your attention, that we would be obliged to place in this so-called second class on account of the peculiar occlusion of the molars, is one form of that common irregularity that is characterized by labial mal-eruption of the

cuspids. These conditions may be caused by the premature loss of the temporary teeth, permitting the bicuspids and molars to drift forward and finally jump a cusp, so as to completely close the space required for the permanent cuspids. Sometimes this movement will be fully the width of a bicuspid, and with no apparent reciprocal movement of the incisors.

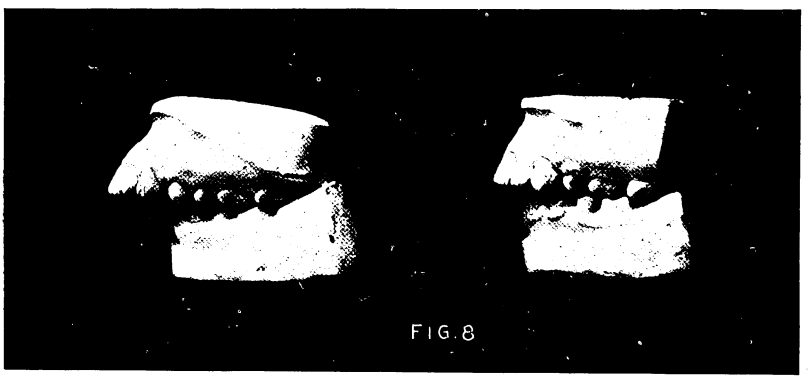


FIG. 8

Commonly the cuspid space is partially closed by the retrusion of the incisors—a movement that may be permitted by the lower teeth being crowded into a smaller arch and malposed. Again, it may be that the condition arises from an inherited upper protrusion which is prevented from assuming its usual form by the premature loss of the temporary cuspids, and the retrusion of the incisors, with little or no reciprocal movement of the back teeth.

If correction is attempted without extraction in this condition, as would be proper in nearly all other cases where this characteristic malposition of the cuspids occur, the back teeth would require to be retruded to a typically normal occlusion; otherwise there would be a proportional protrusion of the upper teeth when the cuspids were corrected. After the eruption of the second molars an attempt to retrude the buccal teeth would

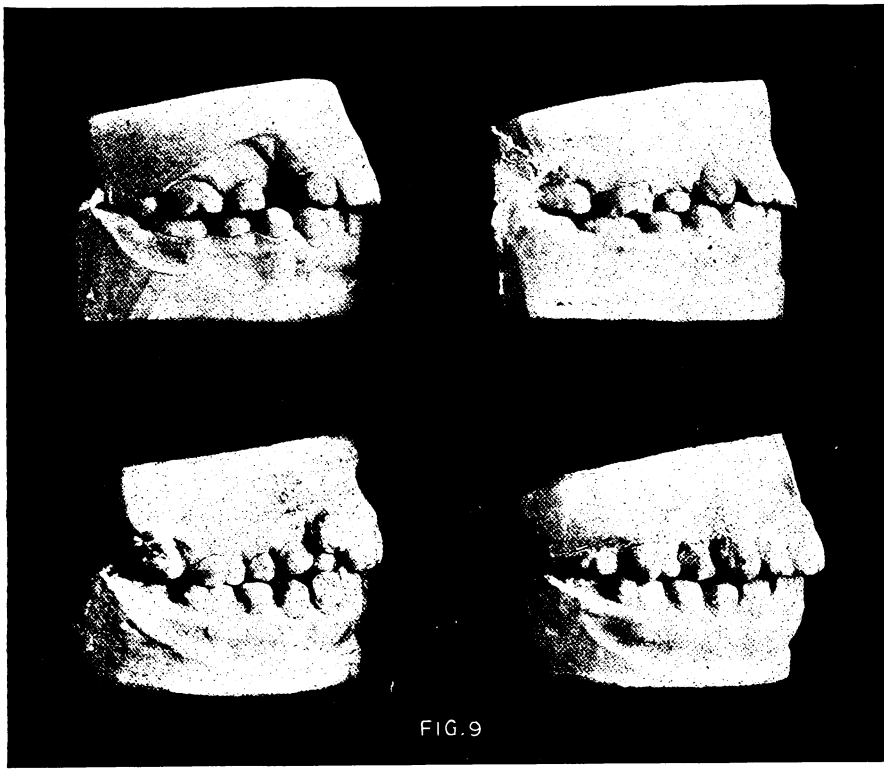


FIG. 9

be a very questionable undertaking, especially if it was demanded that the entire movement should be confined to the uppers, as it certainly would, if the lower teeth and jaw were perfectly normal in their relations.

The diagnosis and prognosis of these cases is often very difficult, and can only be determined by a careful study of occlusion and dento-facial relations, together with a perfect appreciation of the developing influence of growth.

In my classification, this character of irregularity constitutes a class to distinguish it from that most common and similar form which demands correction without extraction.

It will have been noticed in all the seven cases which I have presented, that the upper molars occlude mesially to normal in relation to the lower about the width of a bicuspid, and that the different distinct types of irregularity which may occur with this occlusion differ from each other in character and demands for correction, quite as much as it is possible for them to differ in these particulars from the several distinct types that occur when the occlusion of the molars is normal and also distal to normal in relation to the lowers.

Then why call them a class? It is certainly a very simple method of disposing of the classification of irregularities of the teeth, and one doubtless that will appeal to many because of that fact alone. But is it scientific? Is it useful? Do these particular signs of occlusion or malocclusion in themselves indicate the character of a certain irregularity, or the movement demanded for its correction? Certainly not, if the other two so-called classes are as misleading as the one I have shown; and I am sorry to say that they are when considered in the sense of a classification designed for teaching or practice.

Again I wish to say that the only object of this showing is to emphasize the importance of a classification of irregularities that is governed by the same rule that governs scientific classification in other sciences, viz.: one that is founded upon an experienced recognition of distinct recurring varieties which constitute the general forms or characteristics peculiar to the class. In orthopedic dentistry this would mean—an intelligent grouping in each class of recurring malpositions or dento-facial deformities that are distinctly peculiar to the class, and that require for their principal correction a similarity of movement.

In the classification which I propose and present for your consideration, irregularities of the teeth are first divided into two general divisions:

In the *first* division are placed simple and complex irregularities that are purely dental in character and which cannot be scientifically classified according to the above rule because of the fact that nearly every case is composed of two or more distinct varieties of malpositions.

In the *second* division are placed distinct types composed principally of dento-facial irregularities that are susceptible of being properly classified.

The *first* division includes by far the more common forms of irregularities; and while there is no case however apparently simple in which the type and peculiarities of the physiognomy should not be carefully and intelligently observed this division is supposed to contain only those strictly dental irregularities that produce no marked facial imperfection, and which if properly corrected without extraction or abnormal absence of any of the teeth will result in normal occlusion.

For teaching purposes I have divided them into five groups, according to the five distinct malpositions that require a similarity of movement and force appliances, as follows:

Division 1.—Simple and Complex Dental Irregularities.

Group I. Intrusions and Extrusions.

Group II. Labial and Lingual malalignments, including crowded complications.

Group III. Mal-turned Teeth.

Group IV. Contracted and Expanded Arches.

Group V. Wide inter-proximate spaces between Front Teeth.

By segregating the above malpositions, two or more of which might occur in any practical case of complex irregularity, I am able to show to the entire class, by lantern projections, the different malpositions which each group may assume, together with the appliances and peculiar force that is applicable for correction.

In the *second* division, or classified irregularities, the general malposition is distinctively characteristic of the class, or one of its variations; and while it may contain minor complications, the principal methods of treatment will be the same in every case.

With the exception of Class 1st and 2d, they are divided according to the peculiar facial deformity or imperfection which the irregularity produces; and even with Class 1st and 2d, diagnosis with a view to treatment is dependent solely upon an intelligent consideration of the relations of the teeth to the physiognomy and the harmonizing influences of maxiliary and facial development.

Division 2 —Dento-Facial Irregularities.

Class I. Labial mal-eruption of the upper cuspids that demands correction without extraction.

Class II. Labial mal-eruption of the upper cuspids that demands extraction of bicuspids in correction.

Class III. Protrusion of the crowns of the upper front teeth.

Class V. Protrusion of the crown and retrusion of the roots of the upper front teeth.

Class VI. Protrusion of the roots of the upper front teeth, with occlusal zone normal or retruded.

Class VII. Protrusion of the upper teeth and retrusion of the lower.

Class VIII. Retrusion of the lower teeth and upper normal.

Class IX. Retrusion of the upper teeth and protrusion of the lower.

Class X. Retrusion of the upper teeth and lower normal.

Class XI. Full protrusion of the upper and lower teeth.

Class XII. Full retrusion of the upper and lower teeth.

Class XIII. Bodily protrusion of the lower teeth and jaw.

Class XIV. Bodily retrusion of the lower teeth and jaw.

Class XV. Open bite irregularities with various antero-posterior relations of the upper and lower teeth.

The large number of classes into which I have divided typified irregularities may lead one to infer, as a certain writer did in criticising Dr. Goddard's classification as compared to the three class scheme—that we proportionately increase the difficulties and complications of practice and teaching. The writer thought he could understand and practice orthodontia far more successfully with only three classes of irregularities, the characters of which could be easily distinguished by the simple occlusion of the first molars, than it would be possible with a classification that divided irregularities into a dozen or more classes, each one of which required for its recognition and treatment a complicated study of dental and facial relations. Such a person could also more readily understand and practice medicine if there were only three classes of diseases, which could at once be easily recognized by a simple and definite sign. But it happens that the sciences of medicine and dental orthopedia are not so accommodating.

If the different distinct types of irregularity of the teeth which I have shown, arise in practice, and if it be true that they cannot be properly classified or treated on the basis of occlusal relations, should not the student of our dental colleges whose curriculum includes orthodontia have a right to demand full and perfect instruction in this department?

By bringing together the same conditions that dentists have been treating since the practice of orthodontia began, and by separating them so as to place in each class a definite type that demands for its correction a certain movement or character of force that differs from all the others, we have endeavored to present a classification that will enable us to recognize these conditions and more clearly define, teach and practice orthopedic dentistry according to correct principles of science and art.

It does not make it any easier to be told that a protrusion of the upper front teeth and a retrusion of the lower teeth and other conditions more widely different, belong in the same class, to be treated by the same apparatus and character of force. It might serve to induce certain ones to undertake a difficult operation, but I doubt its simplifying influence to one who can appreciate perfection and who is striving for correct practice.

In arranging the sequence of the classes, I have endeavored to present

them in the order of their relations; but there is no objection to interchanging, dividing or adding to the types, provided that the rules are preserved that should govern classification. In speaking of different types it is not expected that they will be defined as belonging to a certain class number without other qualification, unless for reference or abbreviation of that which is shown or understood, as this would involve memorizing the order of sequence.

In presenting the different classes with the view of teaching diagnosis and treatment, lantern slide projections of drawings which mechanically illustrate the character of the irregularity in its typical form, the occlusion, facial relations and effect are thrown on the screen; different views of the apparatus on the teeth, and finally disassembled and shown in parts. This is followed with lantern slide projections of the models of practical cases belonging to the class.

I have long believed that we will never arrive at the perfect teaching of orthopedic dentistry until text books are written relative to the practical technics of the work, that will enable us to present this portion of the didatic teaching in the form of recitations instead of the usual stereotyped lectures.

With the latter method the student comes to the class usually with no knowledge of the subject that is to be presented; and when he leaves he is more often than otherwise in a mystified condition of mind, so that the little knowledge he has gained will not stay with him long; and as it is impossible for more than a few to take intelligible notes of that which has to be taught with blackboard drawings, charts and lantern slides, relative to the various forms of irregularities and the construction and application of methods for their correction, the final result of our work on the candidate for graduation is something which we too often are obliged to simply close our eyes to.

With the method I propose, the student would be able to come to the class fully prepared to answer all questions relative to the character or characters of irregularity and their treatment that were selected for the hour, illustrations of which are thrown upon the screen.

If these are presented in a perfect sequence of arrangement, properly grouped and classified, the student is kept in intelligent touch with the teaching from the beginning to the end of the course.

During the progress of this portion of the course, the teacher can amplify the work with his individual experience in similar cases, or the methods of others which he believes to be more practical, and other knowledge of importance not mentioned in the text.

Orthodontia Technology.

By S H. GUILFORD, D.D.S., Ph.D., Philadelphia, Pa.

Read before the Institute of Dental Pedagogics, at Buffalo, December, 1903.

In the teaching of orthodontia it is extremely important that we should have a correct understanding of certain principles involved and the practical application of such principles.

Extraction.

One of the questions that arise early in the course of our teaching is "Shall extraction be resorted to in our efforts to align a malposed set of teeth, and if so, under what conditions?"

It has generally been granted by those teaching and practicing orthodontia that in a rather limited number of cases extracting will often simplify and therefore expedite the operation without detracting from the beneficial results obtained.

But this theory, which has prevailed for a long time, and which seemed to be sanctioned by experience, has recently been attacked by certain men who contend that extraction need never be resorted to and that its practice in orthodontia is little less than a crime. Some even go so far as to assert that it is never productive of good and that in all cases it results in harm.

On this account it behooves us to consider the matter at this time in order to determine, if possible, which is the better course to pursue.

It is rather a broad question to ask, "Shall we extract, or shall we not?" for so much depends upon the condition to be corrected and upon the tooth or teeth which it is proposed to sacrifice.

In nearly all of the writings of the extremists who hold to the non-extraction doctrine it will be found that their contention is against the extraction of the permanent first molar.

This seems like begging the question, for I presume every one in this assembly recognizes the great importance of this particular tooth in the arch; its serving as a guide to the proper alignment of the other permanent teeth as they erupt; its important service in mastication during the changes accompanying second dentition, and the harmful results of its loss in allowing the other teeth to wander from their normal positions.

For these reasons and for the additional one that its extraction cannot assist in providing space for crowded teeth in the anterior part of the arch, none of us either advocates or practices the extraction of this tooth.

Neither would we sanction the extraction of any of the six anterior teeth in the upper arch for the reduction of irregularity in that region, but

when it comes to the question of preserving all of the teeth and thereby having an undue prominence of the upper arch, or, the extraction of one or both first biscupids to provide space for bringing such teeth into alignment and thus avoiding protrusion I take it that nearly all would agree that the latter course is the better one to pursue.

In patients over fifteen years of age where the alignment and relation of both upper and lower teeth on one side of the arch are normal and where, on the other, either a lateral incisor or a cuspid has been crowded out of its normal position and where, in addition, the anterior teeth do not call for protrusion, would it not be in accordance with the dictates of wisdom and prudence to extract the first bicuspid to provide space, rather than to disturb the entire line from central to second molar in order to avoid extracting?

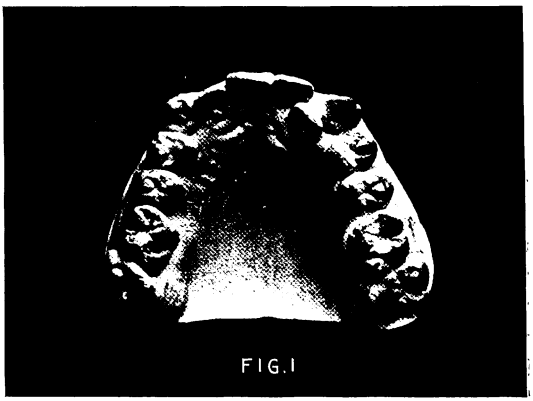


FIG. I

Is it advisable in a majority of cases to perform a simple operation or a complicated one, where the results can be made satisfactory by either?

The extremists claim that whenever extraction is resorted to there can never be an absolutely perfect alignment or relation between the upper and lower teeth.

This is certainly true but may we not, in many cases, after limited extraction, have a very good occlusion and one that will perfectly satisfy all the demands of mastication and probably those of appearance?

It is very well to strive after perfection but do we ever attain it?

I would not be misunderstood in regard to the matter of extraction for where it has been resorted to on a large scale or even injudiciously on a small scale the evils that have followed in its train have been almost numberless and very deplorable, but under certain conditions and within proper limitations I believe it to be entirely justifiable.

To teach students that extracing for correction should never be prac-

ticed would be simply leading them into a maze of difficulty and virtually inducing them to attempt complicated operations that would surely invite failure.

On the other hand to lead them to infer that it should be resorted to in many cases, or for the simple purpose of rendering operations less difficult would be doing them equal injustice.

The proper function of teaching should be to instruct students not only as to the How, but as to the When and Where.

In support of the position that extraction is, in some cases, not only justifiable but advisable I would ask you to look at the representation of two cases in each of which a first bicuspid has been extracted to correct an irregularity which would otherwise have involved long and difficult treatment, with, possibly, less satisfactory results.

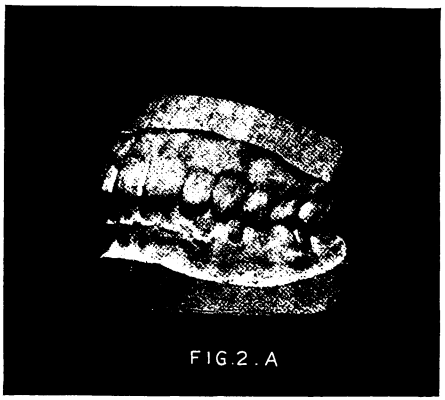


FIG.2.A

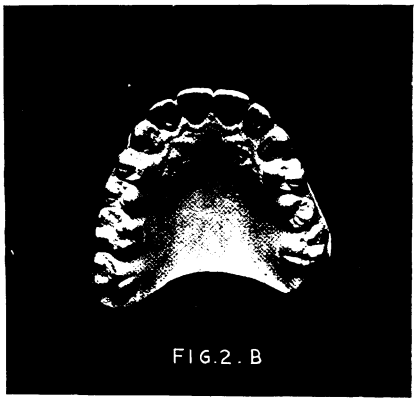


FIG.2.B

Cases from Practice.

In Fig. 1 you will notice that on one side the teeth occlude fairly well while on the other side the lateral is malposed lingually and the cuspid buccally. Owing to this irregularity the upper and lower posterior teeth on that side are not in normal relation either before or after correction, and yet they occlude in such a way as to render perfectly satisfactory service in mastication.

As there was neither protrusion nor retrusion of the upper or lower anterior teeth, but instead, a normal relation, to avoid extraction in this case would have required the moving posteriorly of both bicuspids and molars. Would this have been a very difficult operation or otherwise, and if accomplished would the aesthetic improvement of the case have been sufficient to compensate for the time, difficulty and discomfort involved?

I leave it for you to answer.

Fig. II. A and B represents a case similar in many respects to Fig.

1. The original models are missing but they showed perfectly normal relation and occlusion on the right side, while on the left the lateral was misplaced lingually and the cuspid labially. The first molar on the left had been extracted before the case came to me, but by moving the bicuspids posteriorly space was created to enable the malposed teeth to be brought into position. Here a mistake had certainly been made in the extraction of the molar, and yet, as you will see, the result is satisfactory, for while the occlusion on that side is not strictly normal it is still sufficiently good for serviceable mastication.

I think that none of us would have advised the moving posteriorly of the second molar because it happened to nearly occupy the position of the

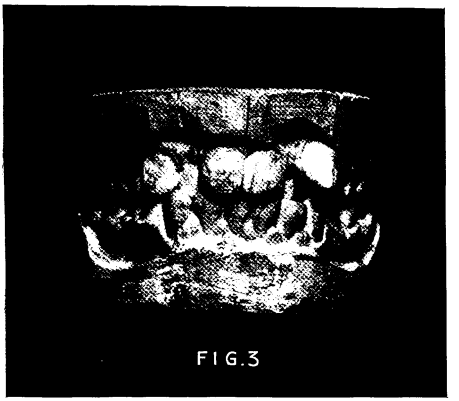


FIG.3

first molar and then to have inserted a substitute for the missing first molar, and yet something analogous to such a procedure has been advocated in the journals.

Fig. III shows models which were sent to me for advice. The child was said to be fifteen years old. As you will observe; both of the superior laterals are misplaced lingually and the left cuspid buccally. The median line is also slightly to the left of its normal position. The relation of the upper centrals and the lower incisors is so nearly normal as not to call for any material change. A slight movement labially of the superior centrals would allow the right lateral to be brought readily into alignment, but to provide sufficient space for bringing the left lateral and cuspid into position would require excessive protrusion of the incisors, the retraction of both bicuspids and molars or the extraction of the first bicuspids on that side.

Should we advise the extreme protrusion of the incisors or the retrusion of all the buccal teeth rather than the extraction of the first bicuspid? I should say, "No."

Fig. IV represents a case in which the superior first bicuspids were extracted eight years ago to afford room for bringing into alignment the lateral incisors which had erupted labially and were considerably turned upon their axes. The patient was then seventeen years of age. The centrals above were in proper relation with the lower incisors. The overbite was normal, and there was neither protrusion nor retrusion of any of the anterior teeth. The bicuspids and molars, however, owing to the opportunity offered by the misplaced laterals had moved forward the full width of a bicuspid.

In this case, the problem presented was that of moving backward all of the buccal teeth on each side, or the excessive protrusion of the anterior teeth or the extraction of the first bicuspids.

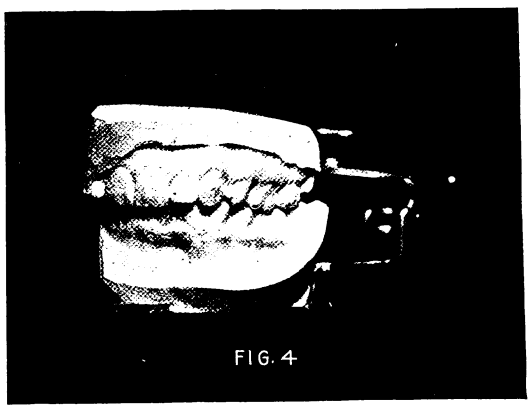


FIG. 4

To have protruded the anterior teeth would undoubtedly have created a deformity of the features; to have moved the buccal teeth backward would have been an Herculean task if not an impossibility at the patient's age. As you will see by the models I attempted neither but removed the first bicuspids instead and brought the laterals and cuspids into line.

The second bicuspids and both molars were not disturbed so that they remain in positions anterior to normal and yet observe how well the teeth interlock and how thoroughly efficient they are for purposes of mastication.

Besides this her features are in perfect harmony and I fail to see how they could have been further improved.

Occlusion.

The question of extraction is naturally very closely related to what is commonly known as occlusion, and before entering upon a consideration of this second phase of our subject let us pause for a moment to consider the appropriateness of the term, for teachers should be exact with regard to the terms they use if they wish their students to be able to express

themselves properly. We claim to be teaching a science, but one of the great features of any science is a correct terminology.

Occlusion, when used in connection with a mechanical action means "a closing or shutting up."

Occlusion, in dental science means the closing or coming together of the teeth. When the upper and lower teeth are not in contact there can be no such thing as occlusion.

The teeth, if normally placed are in proper relation all of the twenty-four hours, but they are in occlusion probably less than one hour of that time. Why then speak of the occlusion of the teeth when we mean their relation to one another?

If the teeth are in normal position the occlusion cannot be otherwise than correct.

The relation of the teeth determines the occlusion, the occlusion determines nothing, for it is simply a coincident condition. As a term used to express the relation of the upper to the lower teeth it is faulty, and its employment is made more objectionable when we read in books and in print such expressions as "a cuspid erupting in labial occlusion" or "a lateral in lingual occlusion" when these teeth are not and cannot be in occlusion on account of their abnormal positions.

"Labial or lingual misplacement" would be a better term and "normal relation" is an expression which fully and correctly describes the teeth when they are in such positions as nature intended them to be.

Some recent writers have made the statement that the natural relation between the upper and lower teeth is determined by the position of the first molars above and below. That when these meet each other in a normal or natural manner the rest of the teeth must come into proper relation. In other words, they claim that the first molar is the key to a correct or incorrect relation of the other teeth.

Certainly if the teeth in one or both jaws are in normal position the first molars will be in proper relation to one another, but does it follow that because these two teeth occlude properly the others must likewise do so? I think not. Why take the first molar as a key? Goddard says that the lower second bicuspid is the "key to occlusion." Which shall we accept, the first molar or the lower second bicuspid? One is as near right as the other, in my opinion.

More than this, who will tell us when these teeth are in their proper or normal positions? Is it when the anterior buccal cusp of the upper occludes between the buccal cusps of the lower? So say the extremists, but it is a well known fact that in certain cases these teeth interdigitate normally when they are in an advance position as compared with those of some other jaw which also interdigitate normally.

To locate these teeth properly we should know definitely their real anatomical position. This could only be done with exactness by determining the distance that this tooth should be from the median line in front and the tuberosity behind. Has this been determined?

In view of this how can anyone lead himself to believe that the relation of the first molars necessarily determines the irregularity; that in any case of malposition the first thing to be done is to bring the molars into proper relation and that after this is accomplished the remainder of the operation will be comparatively easy?

Retentive.

Another error has found lodgment in the minds of some of our profession, especially the younger portion. It is that when the upper and lower teeth have been brought into proper relation the interdigitation of the cusps of the bicuspids and molars will, of itself, prove sufficiently retentive to prevent subsequent displacement.

If the teeth were constantly in occlusion or if they were so for any considerable portion of the time, they would undoubtedly prove sufficiently retentive, but as they are so only at intervals and then mostly during the act of mastication this influence must necessarily be a very limited one. No, the buccal teeth themselves are kept in their normal relation not so much by their interdigitation as by the fact that they stand in a solid phalanx and that one cannot move without displacing the others which would almost be a physical impossibility. Besides, how can the proper relation of the buccal teeth influence the anterior ones in cases of protrusion?

When these anterior teeth are retruded will the normal relation of the buccal teeth keep them from again moving forward? Certainly not.

As teachers, it becomes our duty to see that the younger generation of practitioners do not imbibe erroneous ideas and that they are not led astray by false theories.

This matter of occlusion, or more properly, relation of the teeth, is of the greatest importance and we should have correct and scientific principles to govern us in its consideration. These principles are not new, they have been enunciated by all writers on orthodontia from Kingsley down. They simply need, at this particular time, to be sufficiently emphasized.

Firm Anchorage.

Suitable and positive anchorage for the movement of the teeth is a matter of the greatest importance, for a lack of knowledge concerning it has undoubtedly been the cause of many sad failures.

Time will not permit us to consider the many ways in which anchorage may be obtained in various cases but I desire to bring into prominence the basic principle involved in all.

The truth of the principle that "the point from which we exert force

must greatly exceed in rigidity that of the object to be moved," is apparent to any one having even a rudimentary knowledge of dynamics and yet, strange to say, this principle often seems to be lost sight of in the devising of apparatus for the correction of irregularities.

Even though a multi-rooted tooth will offer far greater resistance to force applied than the majority of single-rooted ones, it is never safe, and hardly ever permissible to use a single tooth for anchorage.

The tipping or even slight movement of a tooth used as anchorage is not only a serious matter in itself, but it frequently complicates and sometimes absolutely negatives the good result sought to be attained.

Furthermore, there is no occasion for assuming the risk that is thus involved unless it be the desire to avoid the labor of special construction and employing instead the adjustable "clamp bands" or other "ready to wear" appliances for sale at the supply houses.

Parts of appliances of various forms and sizes are placed on sale and recommended as suitable and sufficient for all cases presenting, but a combination of parts such as are required for correct anchorage are not offered because such combinations cannot be made except for the case in hand. It is for this reason, probably, that the designers of the marketable products strive to find an excuse for single-tooth anchorage.

Even the use of a long tube to a single-tooth band (as somewhere suggested) will not entirely prevent the tipping of the tooth although it may measurably retard it.

When the anchorage is limited to one side of the arch as it usually is in the movement of an anterior tooth either forward or backward in the line of the arch, the combined resistance of both molars or a bicuspid and molar should be taken advantage of and even then greater firmness will be gained by placing the bands on alternate teeth, as for example, the second bicusped and second molar. And where anchorage on both sides of the arch is required as in moving the anterior teeth "in phalanx" the same method is employed on each side.

Construction of Bands.

It is sometimes difficult, where the second molar has not erupted to its full extent to place a band upon it in connection with a similar band on the first molar or second bicuspid, but the exercise of a little ingenuity will usually overcome the difficulty.

With two posterior teeth banded and these bands connected by the long tube which is to accommodate the screw or bow-wire intended to exert its force upon the anterior teeth we secure as stable an anchorage as it is possible to obtain under the circumstances.

In the making and arrangement of bands which are to serve as the basis for the construction of anchorage appliances some operators construct

them upon the plaster model, while others for the sake of greater accuracy, construct and fit them to the natural teeth while the patient is in he chair. One plan has the advantage of relegating part of the work to the laboratory and thus conserving the time of both practitioner and patient, while the other possesses the advantage of a more certain fit and greater accuracy.

Both of these advantages may be combined by the use of German silver bands made from seamless tubing drawn to various diameters and of varying gauge.

After taking the usual preliminary impression and deciding upon the teeth to be banded, unannealed bands of gauge 36 are selected of suitable size and forced over the teeth to remain until the following sitting. In the meantime, annealed bands of exactly the same size are fitted over the corresponding teeth on the plaster model and the further construction of the appliance proceeded with. The bands placed upon the natural teeth and forced between them and the adjoining ones will be found, by the second sitting, to have provided sufficient space, painlessly, for the placing in position of the operating appliance.

By this method time is saved, accuracy is obtained and the patient is freed from unnecessary annoyance.

Samples of these bands, fitted to the teeth and connected by tubing are shown on the dummy jaw herewith presented.

A Case of Unilateral Luxation of the Mandible of Long Standing and its Correction.

By Dr. Robert Dunn, San Francisco, Cal.

Read before the American Society of Orthodontists, at Buffalo, N. Y., December, 1903.

That the possibilities of the Baker Anchorage have not yet reached the limit is proven by the case which I will report to you and which I believe to be unparalelled.

At least I think you will agree with me that it is above the average in interest, not so much from the nature of the malocclusion, as from the fact that it yielded to treatment to which those of its class are supposed seldom, if ever to respond, especially after maturity.

The case belongs to the subdivision of Class III, Angle Classification. (Fig. 1), and the patient is a young lady past twenty years of age and in very poor health.

At one and a half years of age, the left superior central incisor was lost through accident, resulting in a contracting upper arch and a partial closing of the space occupied by the lost tooth by the eruption of the first permanent molar of the same side.

As the permanent central made its appearance, there not being room for it, the deciduous lateral was extracted, likewise the cuspid to make room for the permanent lateral. Consequently that half of the arch failed to develop its normal length and the permanent cuspid was forced to erupt into labial occlusion.

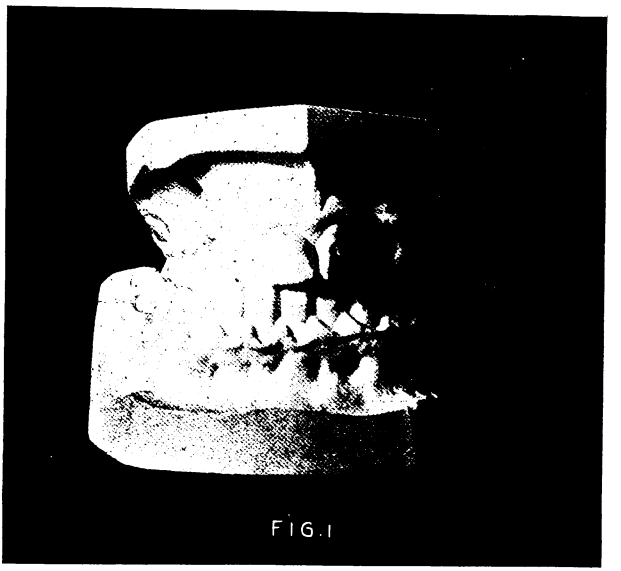


FIG. 1

Why the teeth in the right half of the upper arch should erupt into lingual occlusion instead of those in the left, I have been unable to determine.

As the deciduous teeth probably remained in the mandible their full time, the latter developed normally.

At the age of fifteen and within the same month, the lower left and upper right first molars were extracted because of caries, and the upper left first premolar to make room for the cuspid.

From this time dates the luxation of the mandible as seen in photographs Fig. 2 and 3, the former taken before the extraction, and in which it is shown to be in its normal position, and the latter taken one year after the extraction in which can be seen a lateral position of the mandible.

From these facts, it was concluded that the then existing maloc-

clusion was such, that in the tipping of the lower left second molar mesio-lingually, the lower right first molar lingually and the mesial movement of the upper right second molar, combined with the influence of the inclined planes of the teeth and the contracting upper arch forced the mandible to the right.

The treatment outlined at the beginning was to widen the upper arch mainly by carrying the right half bucally, move the teeth in the left half mesially half the width of a premolar and those in the left half of the lower arch distally the other half of premolar, also to rotate the teeth that were in torso occlusion. Angle D. bands and E. ribbed arches were used both above and below.

Fig. 2.

Fig. 3.

After one month of treatment in widening the upper arch, it was noticed that the mandible was shifting to the left.

In the two weeks following, it had moved about one-third of the distance of the misplacement and there rested.

For the next three weeks no further change was perceptible although widening of the upper arch was continued.

I then placed the Baker anchorage on the left side usin a No. 9 Faber rubber band doubled and at the end of ten days there still continued no change. The No. 9 rubber band was then replaced by two No. 8 doubled.

This change was made in the afternoon and during the night the condyle slipped back into its normal position, accompanied by considerable pain in the region of the articulation, probably due to tension on the liga-

ments and on the bringing into use again of the interarticular fibro-cartilage.

The pain gradually subsided in the next twenty-four hours reoccurring if tension was removed.

In the following three weeks the tension was gradually diminished to one No. 8 single which was allowed to remain for retention, while the movements of the teeth were carried on.

Up to this time no mesial or distal movement of the teeth in the alveolus of either the upper or lower arch had been attempted or had occurred.

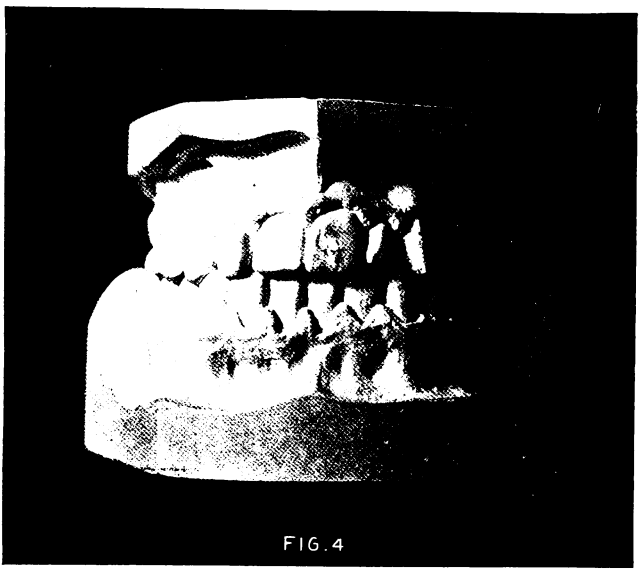


FIG. 4

Fig. 4 shows the case as it appeared after the appliances were removed and while not entirely completed, it was deemed advisable on account of the health of the patient to retain it and finish at some future time.

The mandible was retained with spur and plane, the plane being cut from a nickel and was so formed that when soldered to Angle clamp bands, numbers one and two on lower left second premolar and second molar respectively, it served as a temporary bridge as well as a plane. The spur was fastened to a clamp band on the first molar above. Bands on cuspids joined by a piece of G wire resting upon the lingual surface of the incisor, bands and spurs on the teeth that were rotated and rubber plates above and below formed the remainder of the retention.

Fig. 5 shows the patient before treatment and Fig. 6 as she appeared after treatment.

It is generally supposed, I believe, that luxations standing for any considerable length of time and after maturity are rarely corrected other than by surgical operations and then not always successfully.

If this be true, then the questions arise: Why did the mandible in this case shift back part of the misplacement and then respond to the treat-

Fig. 5.

Fig. 6.

ment that was used to force it into its normal position, knowing as we do from photographs and from models (not now in my possession) obtained when the patient was seventeen years of age, that the luxation existed for over three years?

I will state here that the treatment of the malocclusion at the time the mandible rested, had progressed to such a point that there could have been little or no opposition on its part to the further migration of the mandible.

What was the condition of the temporo mandibular articulation? Was there resorption of the eminentia articularis and a flattening out of the condyloid process?

Dr. Cryer tells us that such can and does occur in some cases.

Also what change, if any, occurred in the glenoid fossia?

Radiographs being impossible, several articulated skulls were examined and in placing the mandible in as near the same position as possible, as that of the patient, the condyle rested upon the articular eminence.

Although I have given this case considerable thought and study, there are yet many points about it in my mind that are unsettled, therefore, I will make no attempt to answer these questions, but will leave them to the society, knowing that there are those present who will be able to shed some light upon the subject.

Discussion of Dr. Dunn's Paper.

Dr. Edward H. Angle, St. Louis, Mo.

Mr. President: I am proud of the result that Dr. Dunn has gained in this quite remarkable case. This sort of case is known to all of us who have had anything like an extensive practice in orthodontia, and yet I believe that this is the first one which has been treated in a manner that we may call successful. I believe it is a record maker.

Since we have had the Baker anchorage none of these cases have presented to me. I tried the treatment of some three cases previous to that, however, but depended upon the headgear and chin retractor for swinging the jaw laterally and backward, but of course you can see this is not good mechanics, for one-half of the force was received on the normal side. I tried these cases faithfully, but in not one instance did I succeed. If we could have had the Baker anchorage then it might have been possible to accomplish much.

I shall be interested to know the further history of this case. It is not enough to know it at this stage. We must know it five years later and see whether the socket has become modified into normal relation with the head of the condyle so that it will remain there. This, I have little doubt, will be the result if no accidents occur.

I cannot account for the rapid movement in Dr. Dunn's case.

Dr. S. M. Weeks, Philadelphia, Pa.

This paper is along certain lines that have given me a great deal of thought, and that is the relation which the temporo-maxillary articulation may have in cases of the second and third classes. It seems to me that if these cases could be treated at the proper age, bringing about the necessary change in the temporo-maxillary articulation, they may result successfully without an extended movement of the teeth in the alveolus. I have had several cases where the occlusion has been such as to bring about a loss of the mesio distal relation and it appeared that the abnormalities were confined to the glenoid fossa. In one case of typical

Class II Div. 2 the superior centrals were retruded with protrusion of the laterals. It appeared that the mandible as a whole was in distal occlusion, rather than within the alveolus. I first removed the obstruction to the mesial movement of the mandible caused by the superior centrals; then with a Baker anchorage applied for ten days, the two arches were placed in proper relation. This case was treated at the college and was allowed to go away without retention. I saw the case again about four months later and while the centrals had returned slightly to their previous condition thereby causing a like return of the mandible to its former position, yet the relation was normal, so that with a very little change in the superior centrals the lower arch came back to its normal position without help and where it remains at this time without retention. I believe that an abnormal temporo-maxillary articulation was changed to a normal one.

We all understand, I think, that in childhood the glenoid fossa is considerably larger than is necessary to accommodate the condyle. The interarticular cartilages are thick and pliable, and it seems quite possible for the angle of the jaw to acquire an abnormal position in the cavity without in any way affecting the osseous tissue. And with a very little trouble we can bring about the normal relation and we also can maintain it without difficulty.

This is a very interesting feature of these cases and one that should have the special attention of orthodontists.

Dr. F. C. Kemple, Erie, Pa. I would like to ask Dr. Angle whether he has had radiographs made of any of the cases in which he brought the mandible forward so as to show what change had been affected in the articulation.

Dr. Angle. I have had a number made but they amounted to almost nothing, being so indistinct that it was impossible to trace with any accuracy the outline of the parts in question. Only one have I seen that was at all clear and of any value, and this seemed to be an accident in photography. I sincerely hope that this branch of photography may yet give us what we so greatly need.

Dr. Kemple. It seems to me that the glenoid fossa and the hip-joint are in an analogous condition. Dr. Lorenz, in operations on the hip-joint showed us that by moving the bones forming a joint, you can form a new joint or place of lodgment for the bone. And the same thing is possible in the temporo-maxillary articulation, and I would like to know what is the condition in that joint after such an operation. The fact that in the case reported the change took place in a night is rather remarkable.

Artificial Substitutes for Missing Teeth in Orthodontia.

By Joseph Head, D. D. S., M. D., Philadelphia, Pa.

Read before the American Society of Orthodontists, at Buffalo, N. Y., December, 1903.

The problem of supplying the ravages made by ill-advised extraction in the regulation and straightening of children's teeth is one of appalling difficulty if the work is to be done permanently and satisfactorily, while the child is young and the gums and teeth are in a constant state of varying relationship.

Any piece or appliance that can be made to fit the gums of a child of eight or nine years, will of necessity not fit those gums when the child reaches the age of twelve, and any piece which is made at twelve years, will correspondingly not fit when maturity is reached. In the same manner, to carve teeth sufficiently for a bridge without destroying the pulp is practically impossible, from the fact that the teeth are hypersensitive and the patience of the child is not equal to the strain. If the pulps in the teeth are destroyed at so early an age, great injury is done to the teeth, as a foramina of the roots are not fully formed, and the dentine has not received its normal proportion of calcified structure.

Viewing these obstacles in a judicial light, they must appear insurmountable, and, therefore, any bridge that shall permanently replace a tooth that has been unwisely extracted, must not be inserted until the child has reached the age of maturity, and the gums and tooth structure on which the bridge is to be built have ceased to change materially. Therefore, it would seem the wisest plan in such cases to get the space required for the proper occlusion of the upper and lower teeth, to band the teeth adjacent to that space, and to solder a bar between these bands and to cement the bands into position, thus holding the teeth in normal occlusion, until the proper time and proper development will permit the permanent, or rather so-called permanent bridge to be constructed; for in spite of the advance that has been made in prosthodontia, the permanency depends upon how long the patient lives. Of course, the bar that holds the two teeth apart should be so adjusted as to receive the occlusion of the upper teeth in such a manner as to prevent the elongation of the occluding teeth.

The bridge most suitable for a molar or bicuspid space, in my opinion, can be made as follows: A gold cap should be made on the tooth posterior to the space. It should, of course, fit the neck of the tooth at the gum perfectly. To this tooth the missing tooth can be soldered with a small lug to rest upon the grinding surface of the tooth anterior to the

space. This will allow the natural mobility of the teeth to be maintained, and will also allow floss silk to be used in such a manner as to make it possible for the teeth to be kept absolutely clean.

This plan is feasible with any bicuspid or molar space, but when the superior lateral incisors are missing, and all the rest of the teeth have come in normally, it sometimes seems advisable to follow another plan. The difficulty and discomfort that ayways arises from replacing lost lateral incisors where there are no roots, is so great that we, as dentists, are averse to saddling a small child with such an enormity.

The upper cuspids should be brought forward adjacent to the superior central incisors, and the first upper bicuspid should be brought into position normally occupied by the cuspids. The lower first bicuspids should be extracted, and the lower cuspids drawn back into their sockets, thus allowing them to fit between the upper cuspid and the first cuspid. The points of the upper cuspids should be taken off slightly, so as to make them look a little more like the laterals that they replace, and the external cusps of the first bicuspids should be relied upon to give the appearance of the cuspids.

This I am well aware is a radical operation, perhaps much open to criticism, but in my opinion and in my experience it has given good results, and I take great pleasure in showing a set of models that represent such a case finished, which came to me during the course of my practice.

Discussion of Dr. Head's Paper.

Dr. J. Lowe Young, Detroit, Mich.

I have had some experience in bridge work, but Dr. Head presents a different phase of the subject from that which I have been engaged in. Of course, bridges must be inserted in cases where teeth have been lost, if we are going to get the best possible result. But I do not believe it advisable to do so while the patient is very young. In such patients the size of the pulp is such as to render proper preparation of the tooth very painful with great danger of subsequent death of the pulp. By the use of cataphoresis, I believe such cases can be successfully treated. I have treated many cases for adult patients with perfect satisfaction, where the teeth were so sensitive that they could not endure having them ground sufficiently so that a cap could be properly fitted. By the use of this much abused appliance I have been able to so obtund sensation, after making an opening into the dentine on the occluding surface, that all the remaining enamel and bell portion of the crown could be entirely removed without causing the slightest pain to the patient. It is a well known fact that the most sensitive portion of a tooth (except when the

Cataphoresis in Crown Work.

pulp is reached) is at the junction of the enamel and dentine; and I do not believe there is any more danger of the pulp dying when the dentine is ground away sufficiently to allow of the proper fitting of a cap than where the dentine has been merely exposed. In all such cases the dentine should be treated with silver nitrate, thus closing up the dentinal tubuli and giving a perfect barrier against the action of the phosphoric acid when cement is used as well as rendering the pulp immune from shock from thermal changes.

Whether or not the action of electricity in forcing the cocaine into the dentine will act as an irritant and cause an acid in the blood I am not prepared to say, but I have never had a case so treated give any trouble. But to me it seems if the current is properly used and the dentine thoroughly numbed, that there is much less danger of there being acid formed in the blood than where the tooth is ground without being so treated as there is much less irritation. Then by the use of gutta percha cement for fastening the bridge in place, the great source of danger to the life of the pulp is removed, namely the prosphoric acid of the cement. With bridges fastened in this way, their removal is very simple in case of subsequent trouble.

Lost Laterals.

I cannot agree with the essayist on the question of closing up the space caused by the loss of one or both of the upper laterals. We all know how unsightly a person looks where the cuspids are placed beside the centrals, and by removing the lower first bicuspids in order to harmonize the size of the arches, the facial lines are so marred as to be very unsightly. And this is not all, for by careful measurement we find that the width of the upper lateral does not correspond with the width of the lower first bicuspid. So if the normal occlusal relations of the molars are maintained in both arches, it must necessarily follow that there remains a disagreeable space between the cuspids and centrals or else between the cuspids and first bicuspids in the upper arch.

In such cases where the patients are young, it would seem advisable to swing in the missinig lateral on a spur soldered to the retaining appliance to be worn as long as possible and then put in a permanent fixture by either crowning the cuspid and fastening the lateral to it, or by using the staple attachment on the cuspid to carry the lateral. By the last method it is not necessary to remove the pulp from the cuspid and there is no gold to show.

Dr. R. Ottolengui, New York City.

Dr. Head is mistaken in thinking that the upper tooth that is most often lost in these cases is the sixth year molar. The race of men who extract the sixth year molar for regulating are nearly all dead. But

the men who extract the first bicuspids unfortunately, are still living; and it seems to me that it is the biscupids that we would be most often called upon to replace in order to get proper occlusion.

Lateral Incisors. The tooth that is really missing most often is the lateral incisor, and we do not always have to deal with the fool dentist. It usually is due to absence of the tooth germ. Those cases that come to us with the lateral incisors absent, and cuspids close to the centrals are the ones in which we try to make space and get laterals in.

We should not attempt to do anything permanent in these cases and I see no reason why the retaining fixture which is made to retain the arch, cannot be made to carry the laterals for a long time. I have seen a fixture for carrying the lateral incisor permanently in the mouth of an adult, which I think, might be adapted for these cases. When I saw this fixture I was very much surprised to see how well it was doing the work. The fixture was a crown over a molar, a long way farther back then was suggested here today. From that molar a heavy bar was extended in such a way as to avoid the occlusion of the lower teeth and to curve forward in proper position to carry the lateral. The bar was made so rigid that in spite of its length there was perfect immobility. The tooth rested against the gum and was not more movable than any other tooth in the mouth. The man had been wearing the fixture for over ten years; but, better than that in these young mouths, would be an open band instead of a full crown, so as not to mutilate the molar teeth at all; I say better, taking into consideration the fact that this is simply a tentative procedure, and that some other method is to be adopted later in life. I would put a band on the molars on both sides, and run along the roof of the mouth a heavy bar; from that another heavy bar to carry the lateral incisor. I am positive that such a fixture could be worn for many years without injury to the teeth, especially if the bands are made from soft gold so that it can be burnished both top and bottom when the cement is being put on.

I take it that a fixture of that kind to carry a lateral incisor would be worn for only three or four years; then the teeth would be fully developed, the jaws all formed, and you can decide what permanent fixture to put in. Even if the foramina are closed at the age of eight or ten, the teeth themselves are not fully developed at that time. The pulps are large; the dentine is not completed; teeth become more solid all the time, and the later in life you remove the pulps from living teeth, the better the result. So that we need not worry so much about this. We need hardly ask our bridge working friends how to do it, because if we can make a retaining fixture to hold the arch, that really is all we need to do.

Dr. Burt A. Abell, Albion, Mich.

One or two things have occurred to me where the lateral incisor is missing and where we have no tooth germ. Some time ago Dr. Young showed me a shell crown that he makes of porcelain, and it has occurred to me that in replacing these laterals the first bicuspid could be covered with one of these porcelain shell crowns, with a platinum matrix and a heavy iridio-platinum bar swung back of the cuspid and the lateral soldered to that. The space is preserved, the tooth is brought into place, and a retaining band covered with porcelain, is not a disfigurement. The face is filled out because all the teeth are there and occlusion will be normal.

Dr. Richard Summa, St. Louis, Mo.

I desire to discuss this paper from the standpoint of one who has assisted in arranging the programme of this society, whose object is the advancement of orthodontia and its establishment as a science. To fulfil this purpose, we must necessarily draw upon the collateral sciences and arts for such of their knowledge as relates to our specialty. It is for this reason that this symposium of prosthodontists on the subject of the substitution of missing teeth in orthodontia is being presented at this meeting.

We have had the good fortune to have met with an artist who taught us the correct relation between orthodontia and facial art. I refer to Mr. Edmund H. Wuerpel, of St. Louis.

Among the transactions of our last meeting can be found the highly instructive contributions of Dr. Kirk and Dr. Cryer upon subjects of anatomy in relation to orthodontia.

We have endeavored to establish the correct relationship between rhinology and orthodontia, but, I am sorry to say, up to date our efforts have met with but moderate success.

Strange as this may seem, it is to my mind more surprising that the prosthodontist who springs from the same parent as orthodontia, the art and science of dentistry, should fail in such degree to harmonize his work with the demands of orthodontia. For, is not occlusion also the basis of all operations in prosthodontia and is not the restoration of the normal facial lines equally demanded of prosthodontia and orthodontia?

I wish to enter an emphatic protest against Dr. Head's suggestion in regard to the correction of the abnormality produced by the absence of an upper lateral incisor. He suggests that we move the cuspid into contact with the central incisor, turn ourselves into odontocides and extract a lower first bicuspid to compensate for the missing upper lateral.

An appreciation of symmetry and facial art and a study of occlusion

will prohibit any one from suggesting such a procedure, not to mention putting it into effect.

What we have heard at this meeting from the field of prosthodontia forces upon me the conviction that there exists a great need for the gathering of the prosthodontists in a society for the advancement of prosthodontia as a science and in order to achieve this result let them draw upon art, orthodontia and other correlative subjects for enlightenment.

Dr. Head. The point made by Dr. Young that teeth could be crowned painlessly by using cataphoresis is a very interesting one, but we should remember that when a tooth is denuded of its enamel in such a way as to cause profound irritation, even though that irritation is at first brought under control by means of cataphoresis, we tend to make a morbid condition in the pulp through inflammation, and we make the pulp unhealthy, perhaps, through the deposition of lime salts. This is a very serious objection to such extensive work as would be necessary to be carried on before any tooth could be prepared sufficiently to allow a band to be fitted around the neck.

Concerning the other points made, the thing that interested me most was the method of having bands attached to the first bicuspid and porcelain put around them. Such a band is subject to lateral strain that would peel off the porcelain and make a very unsightly piece of work. Any one who has gone through the preliminary stages of porcelain bridge work will know that a thin piece of porcelain put over a band is in a precarious condition. The porcelain is weak unless there is sufficient body to it to withstand the strain.

Although I do not remember saying in my paper that the first permanent molars are the teeth most often found missing, I cannot but feel that it is true, and according to my experience and the teachings of men in this country and abroad it is true. When I was studying dentistry there was a regular furore all over the country, the first permanent molars should be extracted, they said, in order to allow the second molars to take their place.

How Much Orthodontia Should We Attempt to Teach Students in Dental Colleges?

By N. S. Hoff, D.D.S., Ann Arbor, Mich.

Read before the American Society of Orthodontists, at Buffalo, December, 1903.

Two considerations or conditions suggest the inquiry which we propound to this Convention, with the hope that some light may be thrown upon the subject by you gentlemen who have especially prepared yourselves for the practice of this branch of our work as a specialty.

The first is that the subject is not now satisfactorily taught in a comprehensive and systematic manner in many of our dental schools. It is true that in a more or less careful manner it has been taught in all schools for the past thirty years; and owing to the fact that here and there an occasional genius at this work has been connected with some school, for a short time at least, something creditable has been done in that particular school. In a few instances the work has been very well done, and sometimes to the extent of taking out time belonging to other technical studies and work of an equally important character. But the nature of the work in itself and the complicated methods of treatment in vogue, have made the subject one to which it has been difficult to give a suitable proportion of the time available in the curriculum of our short term schools without encroaching on time of other important studies.

The second reason for the inquiry is drawn from the fact that there seems at this time to be springing up a sentiment that this work has assumed a sufficiently important place to entitle it to be set apart as a distinct specialty, and that those who engage in this specialty should give up all other practice; in fact, it has become necessary for those contemplating this kind of practice to attend and prepare themselves at schools, or with individuals, giving no other instruction, except in such subjects as have a direct bearing on the practice of orthodontia.

Difficulties Met in Teaching Orthodontia.

What are some of the conditions which have rendered it difficult to give instruction in this subject? A moment's thought will convince every one that the lack of definite knowledge as to the causes of irregularities of the teeth and systematized methods for correcting them have been the great stumbling blocks that have hindered perhaps more than all else. It may be well to say, without stopping for full comment, that this phase of the subject is being rapidly cleared up at the present time. In the very near future, through the efforts of scientific investigators, the use of appliances now available for diagnosis, and because of therapeutic researches by specialists in other than oral specialties, diagnosis at least, will be made sufficiently definite for successful teaching. The same optimistic view can also be taken of the technical treatment, in view of the wonderful ingenuity of the large number of expert practitioners who are taking up this work as a specialty. Appliances are simpler in construction and are made with mechanical precision as never before. In this particular we may hope for teaching material of an entirely satisfactory character, if we do not already have it. The nose and throat specialists, the X-ray pictures, and the several varieties of appliances on the market at reasonable prices, seem to have nearly solved this part of the problem.

The most formidable difficulty is encountered when we undertake to give instruction in this subject to the large classes in colleges. Very few students will take more than a *passing* interest in the subject. Of course, this condition may in most cases be accounted for by the fact that the teacher does not have sufficent skill or knowledge of the subject to command the interest of his classes. This is one of the places where born and not hand made teachers are needed, possibly more than anywhere else, and without casting any disloyal reflections, there are too few of us born right. But for reasons given above many of the former tiresome and uncertain conditions and methods are giving way to definite and successful procedures, and the teacher can now go to his class with more positive assertions than ever before. And really a teacher who is alive to the value of his subject, and is abreast with up-to-date methods ought to be able to go to his class with a burning message every time. It looks very much as though we should have this kind of teachers for this subject in the future, as there are abundant evidences of greater advances in this art at the present time than any other branch of our profession.

Difficulties of Managing Clinical Cases.

There are, however, other difficulties which try the spirits of the most accomplished and ardent instructors, and one of the most pronounced is the clinical management of cases. Unless it is possible to illustrate treatment by actual cases in practice, no amount of technic work or lectures will adequately impart all the instruction necessary to even give students the fundamentals of this important work. In the first place patients to be treated in the college clinic must be on hand in the first part of the year, else the work may be prolonged beyond the end of the session, and the student misses the value of the completed object lesson, to say nothing of the trouble college authorities have in caring for such patients as are left with incompleted work, which may take on disastrous form during the interim of vacations. Students, for lack of experience and attention will not carry along the work as expeditiously as they might, and much time is wasted in unskillful adaptation of appliances. To obviate these faults the instructor is obliged to keep close watch of every case and, in fact, is often compelled to do the work himself, which, of course, is not the best thing for the student, as he loses many valuable points because he will not give that close attention to details which he should. He seems to have the utmost confidence in the ability of his teacher to do the thing properly. This, of course, does not apply to all students, but is perhaps a correct characterization of the attitude of the average student to this kind of work.

We might stop here and very profitably consider what attributes of character and professional attainment are essential for the successful prose-

cution of this work. And when we suggest that great firmness of character, and at the same time large elements of self-control or poise, and a keen sense of the value of diplomacy in handling patients the essentials which will often be called into use, it will be easily apparent that few there be that can meet these specifications near enough to be encouraged to take up this branch of practice with the hope of succeeding in it beyond that of the general practitioner, who merely dabbles in it, to satisfy his patients. One of the best tests for determining whether a student is likely to succeed in this work is to give him the conduct of a case. A large percentage will soon prove that by nature or from inclination they have no inherent ability and may never develop a taste for the work, nor enough skill to do it even moderately well. It may happen that a favorable result will claim a student's interest to such an extent, that by diligent striving he comes to possess fairly good conceptions of the fundamental principles of the art, and he takes it up with a strong desire to accomplish something worthy. A few students will take to it naturally and readily. We find between these extremes all grades of material to work with.

Method by Teaching Required.

Now the question we would ask is, is it possible to formulate a method of imparting this instruction, or of selecting the kind of instruction most needed, that can be adapted to class and clinic methods in our college course, which shall successfully appeal to the undeveloped faculties of the average students? We can readily see how practitioners can give up general practice and attend post graduate schools and take up specialties with an eagerness that accomplishes wonderful results. But such men have something historical and automatic to start with, and they know what they want to learn. But the problem of teaching students without discriminating capacities is an entirely different proposition. It is here that the problem of not only "what, when and how," must be carefully considered, but in addition the cultivation of a respect if not a love for the work which will develop latent personal characteristics, without which no one will succeed in accomplishing creditable results.

In outlining a scheme of procedure for discussion, it would seem that a course should be designed to develop the intellectual as well as the technical side of practitioners of this exacting art. It may be necessary to start with what we term the technics, much as in other branches, and accompany this with lectures on the theory and practice; adding to this clinicad instruction to illustrate principles of practice in the most conclusive manner, also giving a vital relation to the study, which has a wonderful power to lead out the intellect as well as to acquaint the student with methods of handling patients.

Technic Course. In the technic course such work as will acquaint the student with appliances, their manufacture and use, would naturally be suggested as very proper. How far such a course should be carried can only be determined by the time at one's disposal and the values placed on other methods of instruction. If an endeavor were made to include in such a course actual construction of even a limited variety of all the so-called systems of appliances used for correcting irregularities, so much time would be consumed that other methods would be neglected and the student perhaps incur such a dislike for the work that he would not care to engage in it. A brief outline should at least include taking of impressions, securing models from the impressions, studying the models and classifying them as cases, especially as to cause of conditions found and treatment, and then designing appliances for corrections. This last, of course, would call for the construction of appliances and mean experimental construction or adaptation of suitable appliances for the case in hand. In our judgment this work should not be needlessly prolonged, but should be carried along systematically and conjointly with a course of lectures, in which principles, and to some extent so-called systems may be comparatively considered. This will develop interest and lead to more intelligent work of a technical character than is secured when these courses are taken in different years, as is generally the case at present.

Lecture Course. The lecture course should embrace a consideration of the etiological factors in orthodontia, including a review of such embryological and anatomical facts as may be necessary to show clearly how irregularities of the teeth and facial hard tissues have reciprocally responded to the deforming factors. Pictures, drawings and models are here introduced to great advantage, in establishing ideal or typical forms in contradistinction to irregular and unnatural ones. The anatomical relations of the teeth and their functions should also be most carefully discussed. The influence of disease of the deciduous teeth, gums and oral structures, as well as of the nose and throat should be carefully considered and so far as practicable illustrated by clinics or exhibitions of patients. The esthetic values should be given adequate attention, as this from the practical standpoint is an important consideration, since it not only furnishes one of the strongest motives for keeping patients faithful to prolonged and uncomfortable treatment, but lends interest to one's efforts to produce that harmony which nature intended. This much is surely fundamental and necessary; but now we come to the place where possibly the subjects to be taught will be as varied as the methods. A discussion of all the different appliances or methods advocated or reported as cases in our literature would consume a

great deal of time and lead the student into no little confusion as to the best method to adopt. Some teachers feel that a liberal treatment should be given all methods or systems which can be logically sustained, while others contend that it is much more satisfactory that one good method be taught thoroughly. The former method may produce superficial and immature results, while the latter is quite as likely to produce narrowness and bigotry to the extent of seriously handicapping progress. It is certain that a liberal discussion should be either made of the various methods in the class, or some plan should be adopted, perhaps a reading course, that would make students somewhat familiar with the better efforts made to find solutions for perplexing cases. Much material is available for such a course, and it could very much better be dug out by the student than to complicate the effort to present the subject logically in the lectures. We have no doubt some teachers will succeed very well on the plan of a single method, and others perhaps just as well by discussing all systems as to their relative merits, simply because there is a wide difference in their mental and habitual methods.

It may also be valuable to take up the influence which heredity exerts in producing irregularities of the teeth; or to make an exhaustive study of classic art principles that facial inharmony may be detected, and this knowledge used to influence therapeutic procedures. But should these subjects be considered adequately, much time will be used and perhaps the interest of the student be dissipated, because neither of them can be discussed profitably by a teacher who has not given them more or less exhaustive study. And he would need to be a very well balanced man to present these subjects in a manner which would enlist that sympathetic interest, which is essential to the best results. While such topics are desirable from the standpoint of culture and may have valuable practical applications, it seems to us that they are not necessarily pertinent, and should be deferred to another time when their relations may be better appreciated.

A large proportion of most lecture courses is usually given to a discussion of cases in practice and the methods used in treatment, and our text books are padded with descriptions and illustrations of such cases. Very often the same appliance or method is recommended for similar conditions regardless of the causes which produced the irregularity or those which tend to its maintenance. Too many illustrations of this kind confuse the reader just as they will confuse the student; they should only be used to illustrate and enforce principles. And the fewer principles with their variants taught, the more readily the student will comprehend them. Used in this way, the student will comprehend them. Illustrations cited also lose personal characteristics and their consequent complications, and serve to bring out principles of etiology and treatment. The large ma-

jority and especially the most frequently seen cases of irregularities can be classified under a few headings, and subjected to corresponding lines of treatment, with only slight modifications made to meet special peculiarities. It should not be necessary to notice these peculiarities in a lecture course at the risk of confusing the mind of the student. These may much better be taught in the clinic as occasion arises, or learned by the student in practice as necessary. Teachers ought to remember that their chief function is not to impart knowledge in detail, but to put their pupils in the way of acquiring it. There is nothing so stimulating to one's intellect as to discover something. It's as good as winning a battle.

In the lecture course, attention should be given to the physiological changes which take place as well as instruction as to care of pathological conditions which are liable because of accidental causes or from prolonged treatment. The toilet of the mouth is a matter of importance and should have an adequate treatment. The physical condition of patients often modifies treatment, and should be given close attention during the period of treatment, and students should be instructed in a few well chosen lectures by a medical practitioner as to what these conditions are, and how they should be handled. A few lectures on business methods will be of great advantage, as many a practitioner fails to make satisfactory business arrangements and as a result he becomes disgusted with the work and drops it for more remunerative work, when the fault has been largely his own.

Valuable and important as the technic and lecture courses may be, no course in orthodontia can be complete which does not offer an opportunity to see actual cases under treatment. Students very often apprehend more readily with their eyes than brain. This is probably the reason why our eyes are worn out before the brain shows any sign of awakening. They are overworked. The clinic is therefore essential, and as we indicated in the beginning of this paper, it is one of the most troublesome departments of instruction to manage successfully. To get the undivided attention of the student and the entire cooperation of the patient is almost impracticable. And yet if this cannot be accomplished the value of this feature of instruction may be wholly lost. It is not enough that the student shall see the case begun and then completed, and be shown the appliance used to accomplish the result. The details of management from the beginning are of the greatest value and students having charge of the case must experience and study each step in its sequential order that he may derive the greatest benefit. Mistakes made in treatment are not without value, but a mistake from beginning to end has little value educationally. A teacher should have constant surveilance of every case and students should not be allowed to direct the management of cases on their own responsibility or

in accordance with their own ideas. Where practicable every case treated should be shown at proper stages to the entire class, so that the clinical illustrations can be as widely utilized as practicable. But any one who has had charge of a clinic of this kind in a college will know how difficult it is to realize all these suggestions. Students will not meet their appointments, patients will come at irregular times, and students will see the case and the instructor does not. The instructor must do a large part of the work to keep the work going smoothly and to avoid serious blunders. While the clinic should be most instructive, it generally is also most difficult and sometimes quite unsatisfactory. A clinic conducted wholly by the instructor would be much more comfortably managed, but the question is, would the student get much out of it?

Now, I have presented my thought to you, it is true in a somewhat pedantic fashion; but I trust it will enlist your interest to the extent that a fair expression of views may be had which will be valuable to us all. If you can suggest a better scheme of presentation than I have outlined, I shall be glad to have met with you, and thank you for your considerate attention.

Discussion of Dr. Hoff's Paper.

Dr. Edward H. Angle, St. Louis, Mo.

This is a very important subject and the time at disposal is limited, yet this society cannot do better than to devote a portion of its time to the discussion of a topic so valuable as this—"How Much Orthodontia Shall We Teach Dental Students?" I have had some experience in this matter and it has given me some very radical views on the subject. If, in giving these views, I conflict with yours I shall do so honestly, earnestly and sincerely, and I also ask for your views given in the same spirit.

Something should be done. It is not fair either to the public or to dental students that the teaching so long in vogue should continue. I sincerely believe that no subject is taught so badly nor shows such bad results as orthodontia, not even theology. Yet it is one of the most beautiful subjects in dentistry. There is no limit to the amount of good that may be done in orthodontia, and practically no limit to the number of patients. People with money are willing to pay almost any price to have their children's teeth properly treated, but they are not receiving proper treatment. There is a deformed class growing up around us far grater in number than you, gentlemen, realize. You are wedded to the lines of dentistry in which you are most interested, and you do not notice how unsightly, warped, and twisted children's faces are from these deformities, for just in proportion as people have malocclusion of the teeth are their

faces out of alignment. You can see them everywhere and they ought to have intelligent and skillful attention.

In my opinion orthodontia never will be taught successfully in dental schools; certainly it is absolutely impossible to do so along the lines you are now following. It is a difficult subject to teach and to master; it embraces so many different lines that it requires much careful thought and a wide-awake intellect. There is not sufficient talent, aptitude and liking for it among the dental profession generally for even a superficial knowledge of orthodontia, and this is proven by the horrible advice they give and the serious blunders they commit every day in the name of orthodontia. Nor have you the right material to teach orthodontia to, and to attempt to force each student to master it during his college course is wrong. You cannot do it. I believe that there is a certain percentage of dental students who, if placed under the correct environment, would make useful and competent orthodontists, but it is wrong to try to force every student to become an orthodontist. He has not the intellect to grasp it and it is wrong for you to force him to study something that is distasteful and that you cannot, with any amount of time or skill in teaching, make him learn. I have tried it. I had fourteen years' experience in some of the best and some of the worst dental colleges in this country, and I know that my efforts were failures. Of all the students I taught there was not one whom I succeeded in teaching enough orthodontia to enable him to make a livelihood out of the practice of this specialty. Neither has any institution in this country or in the world ever turned out a student sufficiently skilled to make his living by its practice. Those who have succeeded have done so after leaving college, and in spite of their teaching, and with some of us it took long years to eradicate this handicap of unfortunate teaching.

The only men to whom you can teach orthodontia, and the only men who will ever master it, are the ones who are vitally interested; who are thoroughly in love with it; who have the ability for taking infinite pains, not only in what they do with their hands, but in the study of the subjects embraced in orthodontia. The mere tinkerer, be he student or teacher, will make but a poor showing in the modern orthodontia.

Now, surely, the student in college is not in love with orthodontia. Probably he never heard of it before coming to college—you know he comes there to learn how to fill teeth, but principally to get his diploma. You are forcing something on him that arouses his antagonism; you compel him to do that which he does not want to do. I believe many a good orthodontist is spoiled by your methods of teaching. If he has an interesting case in the infirmary other duties conflict and he must neglect it for something else. His patients are of a class that does not appreciate his work. They soon become discouraged and then stay away entirely. A

man, to become an orthodontist, must follow cases all the way through treatment. And he must have many cases. I suppose that not more than twenty per cent of our students ever begin the treatment of a case, and, I dare say, that not over two per cent ever see a case finished. Think of it!

The Four Year Course.

Orthodontia must be taught, but it must be taught far differently from what it is now. I hope the four year course will have much in store for orthodontia, as well as for other branches of dentistry which must be specialized if they are ever to be successfully taught. I have hopes that some time you will see the importance of this, and that in your teaching you will give the student a chance to do the work for which he is fitted and which he likes to do. They won't all want to be orthodontists, or crown and bridge makers, or plate makers, but they ought to have a chance to specialize according to their talents. And that is where the fourth year ought to come in. After the student has spent three years in college he has his likes and dislikes pretty well sifted, and he knows just about what line of work he would like to follow. Then, in the fourth year, give him an opportunity to follow that bent, provide him with the proper material and with competent instructors, and you will obtain a result that has hitherto been beyond your expectations and hopes. But you cannot do it with your present methods.

Post Graduate Teaching.

Some years ago I conceived the idea of forming a post graduate school for dentists who wanted to specialize in orthodontia. I had become convinced of the hopelessness of attempting to teach it to students in dental colleges. I realized, however, that there must be men in dentistry who would like to know the real orthodontia and who were not content with the mere semblance of it, and that was the reason for founding the post graduate school. And outside of finance it has been a great success. Our students come to us with matured minds, with the desire to learn. Here we teach orthodontia only, and the very air is permeated with it. No other phase of dentistry is allowed to be discussed. It is taught in the broadest and most thorough manner possible in all its different phases by the best teachers procurable. In this school there are lectures on art, rhinology, embryology, histology, anatomy and comparative anatomy of the teeth and jaws, all from the basis or central point of occlusion. We also have a generous clinic, and the result of such teaching is very gratifying, as many of you know. It was only an experiment; it was not started for the purpose of making money; in fact, it has never paid expenses, but it has proved conclusively that you must specialize your teaching just as you would specialize your practice. I know from my own experience that I can accomplish a hundred times more by devoting myself to the practice of

orthodontia alone, than I could by mixing it up with all the other subjects. I know that in our little school we make more progress in one day than we did in the dental college in a whole year. Yet I do not believe that schools should be conducted in a private way. This one was forced on me because I wished to see those who had a desire to study orthodontia better receive an opportunity to do so. These schools should probably be parts of universities, and I am in hopes that some of our great institutions will soon establish proper courses of instruction in orthodontia; that they will not try to teach half a dozen different subjects at one and the same time. Such teaching inevitably makes jacks of all trades and masters of none.

Many of you will not agree with me, but that is my honest opinion based on a large personal experience with dentists and dental colleges. I have just closed a session of my school. I felt weak and ill when I started, but it was such a pleasure to teach these young men that I grew better every day in spite of the hard work. But this certainly is not true in the dental schools and I know you men who are teachers will bear me out in this. There is so much to orthodontia that you cannot teach more than a mere smattering after the plans you now follow. And further, it is an axiom that no man can intelligently impart what he does not comprehend himself, and unless the colleges of this country can provide themselves with teachers who at least know the rudiments of modern orthodontia we certainly cannot hope for very much from the students who are to be instructed by them.

As to teaching appliances and systems, there are no systems. I once believed that there was a Case system, a Jackson system, and an Angle system, but I got over that. It was all nonsense. All you want is truth. There is truth in regulating appliances just as there is in occlusion, and all so-called "systems" of appliances fade away when the subject is taught properly and broadly. No one has any trouble to know what are the proper appliances when he is familiar with the principles of orthodontia.

At our school we spend very little time on the subject of appliances, and the long tedious hours that students are now compelled to put in making worthless regulating appliances after patterns long out of date ought to be cut out. You are only making tinkerers of them, not orthodontists. The man who can fit bands and do simple soldering knows all about machinery that he needs to know. I think to compel students to hammer and file and pound and draw wire, and make rubber plates, shows the ignorance of the teacher. He ought to be teaching his boys something they ought to know, for I say, better by far is it to fit each student so that in his life's work he can do some one thing well, than many badly, as is now the rule. Colleges ought to reform.

Dr. A. E. Webster, Toronto, Can.

There are so many things I would like to say on this subject, that I do not know where to begin. The subject in general as laid down by the essayist is very good in a way, but it is not broad enough. I agree with Dr. Angle that it is impossible to make orthodontists of everybody, and yet every dental student should know the essentials of orthodontia. I also think that the teacher who spends his time teaching the making of appliances is wasting his energies. It is much more essential that the student should know the principles underlying orthodontia than the treatment. In teaching we should not undertake to suggest treatment. The student should have been so trained that he comes to the treatment of a case with the feeling that the designing of the appliances is merely a secondary affair; that the etilogy and diagnosis of the case should command his whole attention.

In our school the course in orthodontia was designed by me, but it is not now what it was designed to be. I thought I could teach orthodontia to every student. I know now that this cannot be done; that it should not be attempted. But orthodontia is not the only subject on the curriculum; there are other equally important subjects that command their share of the student's time. Orthodontia cannot receive more than its share of time and attention. It is best to send a student out a safe practitioner in dentistry. About ninety per cent of the cases that come to the infirmary for treatment are there because of a lack of dentistry or because of faulty dentistry.

The subject surely is a very difficult one to teach by lectures. The only plan is to have every lecture illustrated in some way and to teach operations at the chair. My own method is something like this: The lectures are given in the junior year; the technique is given at the same time. I believe that every student should have a good technic training; if he does not get it in orthodontia he should get it somewhere else. If he gets it somewhere else then it is not so necessary for him to get it in orthodontia. Following the lectures comes the infirmary practice. Each student has a case assigned to him. We have such an abundance of material that we do not give the students the difficult cases to treat. We turn these cases away, and the students treat only those cases that are simple and that can be treated and completed within the college session.

The student takes the impressions; makes the models, and then we discuss the case in the presence of the patient. He brings to me, at his leisure, a drawing of the appliances he thinks would be suitable in that case, and also his diagnosis. I discuss that with him, and if I think it is right, I permit him to go on with the work. In many cases I allow the student to go on with a slightly defective design simply because he has

studied it out himself and I do not wish to interfere with original thought. I see the case as often as I can. The student writes up his case; makes plaster models and drawings of his appliances; fits appliances to the models, etc. These are indexed and laid away for future reference, and they are indexed in the catalogue. He can go to the index book in the library and find all the cases under that diagnosis. He can take them out and study them and thus arrive at some conclusion in his own case. If that boy leaves college without knowing something about orthodontia, there is something the matter with him. He does the work himself; does his own thinking; he makes his own appliances; draws his own conclusions; and is thrown, largely, on his own resources, except that he knows that we will not allow him to go wrong. Of course, the essential thing is to make the student think the whole thing out himself; he is put on his mettle; and he is laying a foundation that will prevent him from doing faulty dentistry later on.

Dr. J. B. Littig, New York City.

This discussion has suggested something to me that I wish to speak about briefly. It is all very well for us to say that we ought to teach students along a certain line, but when our students have to go before a State Board and answer such questions as "Whose system is the best," what are we to do? We have to prepare them to answer such questions, even to knowing how to make the various kinds of appliances that they have to use. So that it is not only a question of what we would like to teach them, but also what we are obliged to teach them.

In our school we teach our students to understand all we can. We tell them the whys and wherefores; the etiology of the case, and what appliances should be used to correct it. We use lantern slides wherever we can. But I do not stop there. I say to them that under some circumstances they might correct the tooth that way, but that there is an easier way to do it, and, then, I point the easier and better way.

Then, I hold a clinic once a week in which I treat cases of irregularity. I call for student volunteers to treat each case. Those who do not care about orthodontia will not volunteer, whereas those who are interested always respond. So that they have plenty of cases and they get good instruction simply because they like the work; and they carry out, under my supervision, what they have learned. Of course, in the infirmary we cannot treat these cases as we can in the office. We have to try to get through with the case as soon as possible, because these patients soon get out of patience and they will stop coming before the work is completed. So I tell my students that if this case was a private case I would treat it otherwise, but that under the conditions existing in the infirmary we will have to treat the case as we do. And we always do the best we can for

each case. I always tell my students that if they intend making a specialty of orthodontia to go and see Dr. Angle for six months.

Dr. C. A. Hawley, Columbus, O.

This is so vast a subject that I hardly know just what to say, yet several years of experience as a teacher have forced upon me some convictions. The work in the clinic has been very unsatisfactory, but, as the essayist said, this has been due largely to the fact that the teacher was incompetent. The fundamental principles of orthodontia must be taught; the existence of accurate methods must be shown the student; he must be shown how to make accurate models. And, it seems to me, that the place to teach accurate model making is in the prosthetic department during the first year.

I remember well my experience in taking plaster impressions of full dentures. If the method in vogue then is not the proper method for orthodentia cases, then, it is not the proper method in any case. The principles of occlusion should be taught and they should be understood and studied in their relations to crown and bridge work and to operative dentistry. This is a very necessary subject; the principles of occlusion in modern orthodontia are very valuable, indeed, to the man making crowns and bridges; and to the student in his junior year they are exceedingly valuable. He should not come to the course in orthodontia without a knowledge of occlusion.

There is one unfortunate thing that will happen if students have not some training in orthodontia technique. Only a small percentage of students begin to practice in a large city where there are specialists. Many of them go to small towns where these cases are plentiful and they must do something for their patients. Therefore, I believe that every student should be taught the principles of this work so that he will know something about it and have an idea what is to be done to give relief. The course should not be elective, nor should it be open to those only who have a special aptitude for the work. These cases in the small towns must be treated. Perhaps, they will not be treated perfectly, but the young men can commence upon them, and if successful he can devote a certain amount of his time, say one or two days a week, to orthodontia cases. Finally he may develop in that direction and devote himself altogether to orthodontia. It has always seemed to me that any one who wishes to take up the specialty of orthodontia ought first to have practiced several years in general work, because there are many things that will be of service to him. Training of his fingers would be essential. It is very difficult to determine just what should be taught and how it should be taught. That question can only be solved in the future.

ORTHODONTIA

Dr. G. V. Black, Chicago.

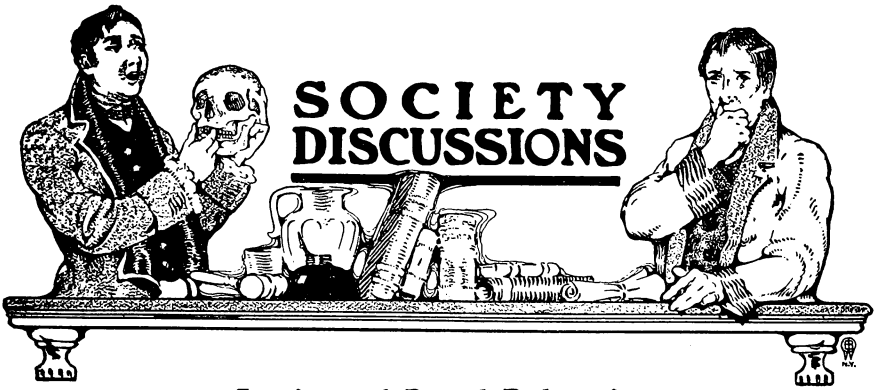
I have had a great deal to do with orthodontia cases in my time. I have regulated many cases myself, and I have seen the results of work done by others, and I know that a condition confronts us and we must meet it the best we can. Every school must teach orthodontia, and to the whole class. I do not mean to say that we can make ideal orthodontists of each member of the class, because that is not expected. And you must not look at us, who are managing schools, as failures because we fail to make ideal orthodontists of each member of the class. There will be one here and there who is adapted to the work and he will develop into an orthodontist, but there will be a great number of these young men who will do the more simple things in orthodontia, as the cases come to them, and do them well. The man who goes through a medical school and starts out to practice in the country will do some things well enough to be a benefit to his community. In the more severe cases he will send for a specialist and not attempt to do them himself; and yet he will be a useful man in his neighborhood. Our men will go out and do likewise. Many of these people cannot go to a specialist because they cannot pay his bill, and the family dentist is compelled to do the work or lose the family.

Dr. Hoff.

I thank you very much for the consideration you have given my paper. Dr. Black has said what I wanted to say in reply to Dr. Angle. We are compelled to teach this subject, and we want to teach it. We cannot afford to do without it. Orthodontia is a part of dentistry and not a separate profession.

According to a statement made here today this subject should be taught by specialists. Another statement says there are but twelve specialists in orthodontia in this country. There are fifty-one dental colleges. How are you going to harmonize these conditions?

The suggestion was made by Dr. Angle that he finds it troublesome to conduct a private school and that the colleges should do the work. To my knowledge he has refused to accept, during the last session of his school, men who are anxious to take up this work. A good man came several thousand miles last fall to enter his school and was refused. How are you specialists going to meet this educational question? If you do not approve of our methods of teaching you should tell us of better ones. That is why I brought my paper here to-day. I know our problems, and I know what we are trying to do. I also realize what we ought to do, and what is expected of us. The colleges are trying to meet all these demands as far as they can do so. I am glad I presented my paper to this body, because your criticisms will do me much good. Your suggestions with what I have seen and heard will stimulate me to work out this problem and I think I can do it, to a tolerably satisfactory degree, at least.



Institute of Dental Pedagogics.

Discussions of Papers by Drs. Case and Guilford.

Dr. A. E. Webster, Toronto, Ont.

To discuss a paper such as the one read by Dr. Case is a privilege. It conveys a complete idea of the points to be considered in a course in orthodontia. As a pupil of Dr. Case, and as a close observer of his methods, I have nothing to say that is not commendatory of what he has done for orthodontia. It must be those who make a specialty of any department of dentistry to whom we must look for advancement; but we must look to those who do not practice specialties for the learning. There is always the danger of a specialist being carried away with a notion of the over-importance of his subject. While this may apply to some of those who are practicing orthodontia as a specialty, it can in no sense apply to the essayist.

I am in perfect accord with the four propositions set forth by the essayist in introducing the subject. As little time as possible should be spent on the manufacture of stock materials. It will suffice to familiarize the student with their main characteristics. It is much more important for a student to acquire manipulative dexterity while making something useful, than in doing dummy work. It gives his work interest. For the past four years orthodontia technic has been taught in the Royal College of Dental Surgeons, in the manner outlined by Dr. Case, making such modifications as the conditions of the curriculum of the college demands. The results have been fairly satisfactory, but not all that could be desired. There is no fault in the general plan, but with the present manufacturers it is impossible to carry it out. As stated, the foundation principle of comfortably carrying out any method of teaching this subject, is a uniform system of measurement, and then to have the partially prepared materials made to suit these conditions. Up to the present time I have found no satisfactory screw plate. The holes are not uniform in size, the threads are

not always well cut, nor of the same number of threads to the inch. There are no draw plates with the proper sized holes to correspond with the screw plates. And even if they were made so, they would soon wear by use until they would not correspond. Any tap blanks and drills we have been able to get are so variable in size that they are an eternal nuisance. One almost slips through the screw plate without cutting a thread, while the next one will not enter at all. The square tubing for nuts has such a large hole in it, that the smaller sized nuts cannot be made from it. If these and other difficulties of detail could be overcome, it would be a pleasure to teach orthodontia technic as outlined. It is the exactness in detail that leads to success in this subject more than in any other department of dentistry. When these partially prepared stock materials are accurately prepared the greatest difficulty in teaching orthodontia technic shall have passed away.

Terminology.

I agree with the essayist that there should be a uniform nomenclature and a much more comprehensive and accurate one than has been in use. There are many malpositions of teeth that cannot be accurately described without a cumbersome circumlocution, and there are words borrowed from other departments of dentistry, that do not convey an accurate idea. While the essayist has carefully defined some words, he has in other cases attacked words which express a definite position of a tooth, or number of teeth. If there be an objection to saying that a tooth is in "mesial occlusion" how better is it to say "anterior relation." Anterior relation to what? They must be anterior to something. If normal is meant, why not then say, mesial to normal. The difficulty is quite clear to anyone who has ever attempted to analyze these terms, and the classifications made in our modern texts. But the substitution of anterior and posterior for mesial and distal, does not get out of the difficulty. All of these terms express relation and the whole difficulty can be gotten around by basing the classification of irregularities and the positions of the teeth on the physiognomy. For example: There are normal profiles, there are protrusion and there are retrusions. This brings me to the classification, but before discussing that let me say, that there is a serious objection to saying mesial occlusion, or lingual occlusion, or labial occlusion. But there can be no objection to saying mesial position, or lingual position, or labial position.

I may start out with the statement that I am not in accord with any classification of irregularities that I have ever seen; not even the one in use in our own college. But I must say for it, that there are fewer objections to it than to some others. The status of any subject can be judged by the accuracy and completeness of its classifications. Thousands of pages of more or less useful literature were written on orthodontia before any classi-

fication was ever attempted. As the knowledge of the subject advances, so will the classification. The putting of names on certain existing conditions, is like naming holes on a golf course. The name should be based on some characteristic of the condition. Classifications of diseases in general medicine are based on anatomical locations, pathological manifestations, etiological factors, symptomatology and only very rarely upon treatment. Any classification which is partly based upon anatomy, and partly on symptoms and partly on treatment is not logical. The whole of any classification should be based on the anatomy or on the pathology, or whatever masis is chosen. To base a classification on treatment, is surely not scientific, or to criticize another classification because all the irregularities in one class are not corrected by the same force or appliance, is far wide of good criticism. We know quite well that the treatment for malaria is quinine, and yet it would hardly do to class this as a disease, simply because quinine will cure it. Classifications should be made having in view the etiology and pathology. And until something is known of the etiology of irregularities no acceptable classification will ever be made. A classification based upon the pathology alone does not suggest the treatment, while if based on the etiology the treatment is suggested.

Normal. Protrusion. Retrusion. Apical. Incisal.

The classification presented by the author is simply naming conditions as they present; to make it comprehensible it might be well to divide facial deformities into protrusion and retrusion, each with the modification of apical and incisal protrusion or retrusion. While Dr. Case's classification can be studied out, yet it can be more easily understood if they were extensions of an original type. The objection in chief is the basing on treatment and not showing the relation one bears to another. The classification which Dr. Case combats in his article is perhaps as defective as it is possible to be.

I quite agree that there should be a text book on orthodontia, written in a way that certain conditions might be carefully read before a lecture is delivered on the subject.

Dr. Guilford's Paper.

In Dr. Guilford's paper there is a plea for the teaching of correct principles; no more useful plea could be set forth. Perhaps fully seventy-five per cent of all cases of orthodontia attempted might about as well have been left alone. The difficulty is that correct principles are understood by only a few who practice orthodontia. What are correct principles in extraction, for example? There are those who live and teach even in the year one thousand nine hundred and three, that the first molars should be extracted, to correct deformitites in the anterior part of

the mouth. Some advocate symmetrical extraction. These were thought to be correct principles years ago, but not so now. Unfortunately orthodontia is not yet on a scientific basis. It is always this or that man's practice that is being discussed, the subject or the principles of orthodontia are only incidental to the discussion. To illustrate, in America the disciples of Jack would not use anything except spring wires, those of Angle, the clamp band and the outside bar. There are those again who see no good in either bands, nuts, screws or springs; the plate is the only thing. It will take years to sift out the best from all these.

How can correct principles be taught when we do not know the causes which lead to the deformity? Do we really understand what forces direct the teeth into their normal positions and retain them? But vaguely, I think. Then how can we know the cause of even the simplest case of deformity, much less how to treat them; and to treat a disease without knowing the cause is mere imposition. I once heard a prominent teacher of orthodontia say, that he did not care a whit about the cause of a deformity, all he was concerned about was its correction. Such ideas are contrary to good teaching. In proportion as the normal condition is understood, so will the abnormal be recognized and in proportion as the cause of the abnormal is understood so will the treatment be successful, and normal occlusion obtained. The correct principles underlying the extraction of teeth cannot be understood unless there is a thorough comprehension of the normal physiognomy, normal antagonism of the teeth and what forces and conditions cause a normal development, and what forces an abnormal development. The teacher of orthodontia who spends his time in the discussion of an appliance for every deformity and but lightly reviews the anatomy, histology, physiology and principles of applied dynamics, has missed his opportunity.

In both papers just read the taking of the first molars and the cuspids as guides has been criticised and perhaps rightly, if taken as sole guides to correct occlusion, but improperly if only taken as suggested guides. Few dentists know what tooth occludes with certain others, while if a starting point is taken as suggested by Dr. Angle, it is simplified. I have found the suggestion of great assistance in teaching, but of little value in its extreme.

In closing I desire to say that the criticism of the term occlusion, as used by some authorities, is well taken, also the criticism of "Ready to wear appliances."

Dr. H. A. Pullen, Buffalo, N. Y.

The subject of Orthodontia Technology as presented to us this evening by Dr. Case, is one of special importance to the teacher and practitioner at the present moment when the science of orthodontia is making

such rapid progress that its perspective is only visible to the few who have given it special study and along certain definite lines.

There is only one section of this paper which I am going to discuss to any extent, and that deals with the classification of irregularities, and it brings up the question as to what we shall teach as of more mometary importance than how we shall teach.

The essayist asks you to adopt his scheme of classification without question as to its comparative excellence. Would it not be wise to argue the matter pro and con before deciding this question which is one of vital importance, and which deals with the foundation principles of this science, according to our present knowledge of the same?

A few years ago, there appeared upon the orthodontia firmament a radiant star, which at first startled us by its brilliancy and grandeur, but which, as we studied and observed its splendor, gradually illuminated our horizon, and shed its beneficent rays upon a grateful science, which so developed and improved in a short time that the star was considered an absolute necessity for its existence, and further advancement.

Occlusion.

Gentlemen, that star was the theory of occlusion in all its relations to orthodontia, as discovered by Dr. E. H. Angle, and it will stand as a monument to his untiring efforts for the advancement of orthodontia for all time.

The advocates of occlusion make all their deductions from an ideal condition of normal occlusion, which condition, though a temporary one, we grant, is yet sufficiently permanent to account for the normal eruption of the permanent teeth through the influence of the inclined planes of the cusps of erupting antagonizing teeth; sufficiently permanent to account for normal interdigitation and interlocking of cusps of the permanent teeth through interdependence of the arches of teeth, sufficiently permanent to be an integral and important factor in the laws of articulation as given us by the late Dr. Bonwill, and which are now taught in every college in the land; sufficiently permanent for the unaided retention of the normal position of certain simple irregularities which have been corrected; sufficiently permanent to warrant the founding of a classification of irregularities of the teeth from the variations from this normal condition. By it diagnosis and prognosis are rendered more accurate and scientific than by any other method; yes, and our experience justifies us in granting it sufficient permanence so that restoration of these ideal conditions by proper treatment restores the ideal facial lines when faulty on account of malocclusion.

Normal occlusion is a condition of perfect relationship existing between the normally formed and aligned teeth of normal dental and alveolar arches of maxilla and mandible, when in antagonism, the mandible being in its

farthest posterior position and in perfect median register with the maxilla, and both in normal relationship with contiguous tissues.

Such a condition precludes abnormal relationship of contiguous tissues, such as over or under developed alveolar or maxillary zones, or maxillary or mandibular protrusions or retrusions, and in its most pefect conception can only be seen in a perfect anatomical subject.

The facial lines are dependent upon the normal occlusion for their normal relationship, hence, the occlusion is the factor of prime importance rather than the facial lines.

In the three-class scheme of classification, the facial lines are only symptoms of each class, being variable in the first class, and of a certain more definite and recurrent type in the second and third classes.

Shall we diagnose a case of irregularity from symptoms which disappear upon proper treatment of the occlusal relations of the teeth?

We would have it understood that normal occlusion is incompatible with any degree of irregularity, and that with this ideal relationship, normal occlusion and normal facial lines are inseparable.

In the diagnosis of any case of malocclusion, the occlusion is first noted, and then the variation of the facial lines from the normal, and in every case the variation of the facial lines from the normal is considered as caused by a variation from normal occlusion, and is, therefore, a symptom of faulty occlusion.

Classification, dependent on variation from normal occlusion, more than answers our requirements in diagnosis for the majority of cases, which are typical of the class to which they belong.

In the cases in which the essayist has extracted, I think that more ideal results could have been obtained, both as to facial contours and occlusal relations by saving all of the teeth and adjusting the occlusion to normal conditions.

Extraction.

The pictures thrown upon the screen are not convincing to my mind that a case of Class II (Angle's classification), for example, of distal occlusion of the lower arch, is not amenable to the treatment for the class, of restoration of normal occlusion, preserving, of course, the full complement of teeth, at the same time restoring normal facial lines, and using a simple appliance, the arch and clamp bands as used in the Baker anchorage.

This is in marked contradiction to the results obtained by the essayist, who has left the lower jaw in its posterior position, extracted upper bicuspids, and not improved the facial lines by the operation to the extent he might have done by more conservative treatment.

The paper presents no basic principles, from which deductions as to

diagnosis and treatment may be made. Occlusion as a basic principle has been entirely ignored.

Deductions made from any other basis than that of occlusion are unscientific and unreliable. Occlusion is the prime factor for consideration in every step in orthodontia, in etiology, diagnosis, prognosis and treatment.

In the treatment of Class II (distal occlusion), restoration of normal occlusion is usually brought about by changing the occlusal relations of all of the teeth of both arches, moving the lower teeth forward and the upper teeth backward, at the same time changing abnormally shaped arches to normal. This operation, performed either unilaterally or bilaterally, as indicated, is different from that of jumping the bite and much to be preferred.

The retrusion of the lower jaw is a type of case of very common occurrence in my practice, and I do not feel justified in simply extracting the first bicuspids and forcing the upper anterior teeth back beyond their normal position, and leaving the lower jaw in its abnormal pose.

Extraction is the exception to the rule, and seldom resorted to in the treatment of any of the three classes of malocclusion.

Classification. The classification according to occlusion has come to stay and it is only a question of time, when it will be accepted by all those who are working for the upbuilding of this benevolent science.

In answer to correspondence with the author of the theory of occlusion regarding Dr. Case's classification as proposed in the essay this evening, he has this to say: "Think of dividing malocclusion into some twenty different classes! Why classify it at all? Why not leave it in chaos? for this is not much better? And then, too, think of twenty different classes without once mentioning occlusion! How is that for a scientific classification, when we know that occlusion is not only the very basis of orthodontia, but of all dentistry, and that every operation in dentistry has a bearing on occlusion." It seems to me that Dr. Case is attempting to classify the superficial symptoms rather than the fundamentals. It is apparent that he does not understand my classification, and I am constrained to believe that he does not appreciate the simple principles of normal occlusion.

In reality it is not my classification. It is Nature's. I have simply pointed out the classes, divisions and subdivisions in which Nature arranges the teeth in malocclusion. These classes are not arbitrary nor new. They have always existed, and always will exist as long as man suffers from malocclusion, and these different classes, divisions and subdivisions

may be renamed and rearranged, but what they are called would not or could not make any difference in the actual conditions existing.

I believe the teachers, and certainly, the students of orthodontia, who familiarize themselves with these conditions, will not only find out that it is the natural grouping, but will derive from it great comfort in the diagnosing and treatment of their cases. Since recognizing the principles in this classification of malocclusion, my own practice has been immeasurably simplified. "In art—in all things, the supreme excellence is simplicity." If anyone shall give us a better classification than the standard one now existing, no one would be more pleased nor more heartily welcome it than myself, but until that time I am quite content to leave the whole matter in the hands of the thoughtful, conscientious students of orthodontia."

Dr. Guilford's Paper.

It is very evident from the reading of Dr. Guilford's paper that he also does not consider occlusion in its proper light nor give it the importance it deserves or he would not have asked under what condition it was advisable to extract, nor would he have committed the error of extracting in some of the cases which he has shown us, where it was certainly contraindicated, according to our present knowledge of the demands of occlusion. However, there are cases in which extraction is advisable, as even an extremist will admit, but only where the demands of occlusion sanction it, where an improved rather than an ideal occlusion seems called for. Nor can a set rule for these cases which shall be inclusive of all conditions be formulated, because of such factors as the condition of the teeth themselves, peculiarities of occlusion, the temperament of the individual, etc.

I have already intimated that the occlusion was of sufficient duration to account for cusp influence in all its bearings on occlusion, and I cannot be persuaded that its influence is so momentary as to "determine nothing" as the essayist indicates.

"Relation of the teeth" is not a synonymous term, for the teeth are related in all positions of articulation, but they are not in occlusion except in one position, which I have already explained.

It is true that we have expanded the term "occlusion" to include relation as well as position of the teeth while in occlusion. A better term has not been suggested, and I believe the term "occlusion" will stand on its merits.

The essayist himself has some difficulty to dispose of the term in his paper, for he speaks of "the first molars occluding normally," where it is certain he meant the normal relationship of the teeth.

Dr. Guilford has again misunderstood the meaning of the expression

"key to occlusion," as related to the first molars. The extremists, as he calls them, mean by this that only with the first molars in normal occlusion and relation, is the normal occlusion of the other teeth possible, referring especially to the antero-posterior or mesio-distal relationship.

Again, I cannot agree with the essayist in his ideas on single tooth anchorage. In hundreds of cases in which the first molars alone were used for anchorage, no harm has as yet resulted in a single case, and although it is advisable to use re-enforced anchorage in many cases, the first or second molars or even the second bicuspid may be used for anchorage for the majority of cases, for the attachment of buccal arches.

In both of the papers presented, occlusion in its proper sense has not been recognized. Occlusion is not an impractical nor is it an inapplicable basis for its importance is understood and its benefits appreciated by a large number of thoughtful, studious and unbiased practitioners.

In my own practice of orthodontia as a specialty, occlusion is the one consideration without which I would be at sea in diagnosis and treatment, and would consider myself entirely ignorant of orthodontia as a science with a scientific base.

If occlusion were of no value, the specialist who has had practical experience with it in diagnosing and treating cases would be the first to discredit it, but those who do understand the theory and practice of orthodontia from the basis of occlusion have nothing but praise and commendation for it, recognizing that the science has been placed upon a higher plane than ever before through its use, and that the benefits to humanity have been multiplied manifold.

Is it wise to leave it out of the college teaching?

In this discussion, I realize my inability to more than state the advantages to be derived from the adoption of occlusion as to the basis of the science of orthodontia.

The preponderance of evidence in favor of the theory as the chief consideration in the management of any case of malocclusion, must lie in the results obtained through its use, and I can only recommend to your observation and criticism, the esthetic results in restoration of normal occlusion and normal facial lines obtained by the earnest advocates of occlusion, as their clinics and practical work along this line shall be brought to your attention, in your societies or in the columns of the dental journals.

Dr. R. H. Hofheinz, Rochester, N. Y.

The question of nomenclature reminds me of a story told of Bismarck who said that each German ought to have his own king. After listening to the discussion I feel that each dentist ought to have his own nomenclature.

I do not agree with Dr. Webster in regard to the lack of principles

in orthodontia. He said that we do not understand principles as yet; that usually we are discussing methods. It seems to me, however, that we understand the principles pretty well, but that there is a great discrepancy as to the methods to be used. I think that we understand the question of occlusion; the pathologic changes that take place in the peridental membrane; and also the teeth in malocclusion. What interests me is this: Dr. Case remarked that there are fifteen different methods by which you can rotate teeth. Now, which of these many methods would Dr. Case teach his students in the orthodontia department? Is it advisable to teach them the general technique, or is it better to give them a special method? It is unfortunate that we have not with us to-night more men who advocate different methods. In this particular field we have the method of Case, Jackson, Angle and others. Would it be advisable to chose one method for teaching, or would it be better to teach a general method embodying the principles of treatment for these conditions?

In connection with the question of a four years' course—if there is any one department in the college that requires more time for teaching than is given to it to-day, it is the department of orthodontia. Whilst it is possible to teach the students the proper technique of making an apparatus in a short time, yet the philosophy of orthodontia can only be taught after a thorough understanding of the anatomical relations and of the scientific side of dentistry. And that should be taken up in the fourth year of the course.

Dr. J. B. Littig, New York City.

My method of teaching this subject includes the projection upon the screen of the methods of each individual who has had success in regulating teeth, as far as I am able to obtain diagrams. I then criticise each and show how an operation may be done by other methods. I go through the whole series of irregularities, giving the cause of each as I understand it. It is very difficult to say just what is the etiology in many of these conditions, and I doubt whether anyone does fully understand it. We have classifications which do, in a measure, comprehend what we should present to the students.

It is very difficult to illustrate all these methods on practical cases because the student to whom a case is assigned, may graduate before his work is completed or the patient grows tired of coming to the infirmary and drifts away, so that the student may not get the full benefit of his work. Therefore, the best way is to do the practical work as simply and as quickly as possible, and we must be governed in our teaching accordingly. I tell my students what I would do if I had a certain case in my office, but under the circumstances, when we do not know how long patients will submit to treatment, it is better to do something that will

correct the trouble as quickly as possible in order that they can be discharged promptly.

Sometimes, in our own practices, we have to depend upon the character and appreciation of the patient. I am reminded very much in this connection of a maid that was sent to me by a patient with the request that my assistant clean her teeth; my assistant happened to be busy and I free and I said I would attend her myself. I cleaned them and put them in good order; but imagine my surprise when upon examining her teeth in the mirror, she said: "But, you have made them look like false teeth." A similar lack of appreciation is just what we have to contend with in orthodontia. In some cases we can regulate without extracting, taking from eighteen months to two years for the work, whereas in others we must extract so that the work may be completed in a very short time.

Dr. R. S. Hoff, Ann Arbor, Mich.

All that has been presented to us has been very good. This is the first time that I have heard Dr. Case make a classification of his work, but I am not prepared to sanction it, because I do not understand it. He passed over his models and appliances too rapidly.

This question of teaching technique is one that we ought not to overlook. Possibly we have been teaching too much technique. Some of us confine the technique to one system, while others spread it out over every system. In my opinion none of these methods is ideal, but a certain amount of that work must be done because of its value in teaching and developing manual dexterity. As to what shall be presented by the lecture method, and how, that is a matter each teacher will have to decide for himself. I like the Angle system and classification. It is simple, easily understood and definite. Students comprehend it quickly and they can utilize it, and for that reason it commends itself.

There is another method of teaching this subject that has not been mentioned, and that is the orthodontia clinic. There is nothing that will drive home the lessons of orthodontia so profoundly as a clinic. I do not mean that the teacher should do the work for the patient, but that the students, under the teacher's supervision, should do the work and carry the case to its completion. In this way students will learn the principles of orthodontia very much better than they can from the technique course, or from demonstration on models and appliances, or a didactic course.

Dr. Ellison Hillyer, Brooklyn, N. Y.

I hope Dr. Case will answer all the questions that Dr. Hofheinz asked. There are different methods of performing operations, and it seems impossible to teach the various technique in every case. I would like to know how Dr. Case would unify all methods and merge into one general system for student instruction, and whether he would have such

instruction carried out on a line with the recitation from the textbook *at the same time.*

Dr. Case. Occlusion.

My classification met with about the reception that I looked for from the adherents of the three class scheme. One would judge from Dr. Pullen's remarks that I had attacked the great principles of occlusion and their importance as a factor in the correction of irregularities of the teeth. Nothing was further from my intentions as my paper will show. The reference that it makes to occlusion is to show that it cannot be used as a basis or guide for determining the character of an irregularity, nor in any sense to indicate the treatment that should be used for its correction. And I think that I have proven conclusively, by the illustrations I presented, that this is a fact.

In the correcting of all irregularities of the teeth with the view to their permanent retention, occlusion is one of the most important factors for consideration in diagnosis and prognosis.

In every case where the masticating teeth have established a fixed occluding position with cusps that interlock or interdigitate, whether it be typically normal in its relations or not, any change of that position necessary for the accomplishment of correction should place them in a new occlusal position of self-fixation, else nature, either in her forceful efforts to perfect the function of mastication, or in response to the law of inheritance, will mar or wholly destroy the perfect results of treatment, even though they be artificially retained for years.

In cases where one or more teeth of either jaw are crowded out of the arch alignment, or are abnormally turned and overlapping, if held in that position by the fixed occlusion of other teeth, any movement to accommodate them that is destined to affect the relative positions of the bicuspids or molars will usually require a concomitant movement of the occluding teeth of the opposite jaw.

In a large proportion of cases, and especially those which appear in the simple and complex groups, the relative size and general relation of the jaw bones are in perfect harmony with the stage of their development, or sufficiently so to make the rule imperative, that we strive to produce a typically normal occlusion—an attainment that is impossible where teeth are extracted merely to simplify the operation, or under a mistaken impression that regulation cannot otherwise be accomplished.

Extraction.

This does not mean that the principal and only object in practice is to attain to the production of a typically normal occlusion at the expense of producing or retaining a facial deformity; and especially when by the extraction

of the first or second bicuspids we can place the operation within sure and easy possibilities of correcting the facial deformity, and leave the patient with a good masticating occlusion—often so perfect that only an expert is able to discover that teeth are missing.

In the contemplation of obtaining room for the correction of malposed teeth, or for the freer eruption of the permanent teeth, by the expansion of an immature arch or by the extraction of the temporary or permanent teeth, the harmonizing influences of growth with the natural enlargement of the alveolar arches should never be lost sight of. If dentists would give more thought to this subject and to the possibilities of judiciously enlarging the arches in keeping with the present and future development of other parts, there would not be that ruthless and uncalled for interference and that wholesale malpractice of extraction that now disgraces the science of Orthopedic Dentistry.

With modern methods and principles of applying force to the teeth, the dental arches can always be sufficiently and harmoniously enlarged—at both the occlusal and apical zones if required—to place malposed ones in perfect alignment. Therefore that phase of the question should never arise as an obstruction to correction without extraction. But the principal question which should be considered under these circumstances is: Does the present condition, or will the future development, of facial contours demand or permit, such an expansion, with a concomitant movement of opposing teeth, if necessary, to perfect the final occlusion.

In the old methods of enlarging the dental arch with plates, etc., and even with some modern appliances, the arches were always expanded laterally with little or no thought to the possibilities of the far more important distal movement of the bicuspids and molars, which is frequently demanded to restore them to the position from which they may have drifted and which nature intended they should occupy, to prevent the front teeth from being proportionately protruded.

It, however, is not advisable, after the erupting of the second molars, to attempt an extensive distal movement of back teeth that have not been moved forward by natural or artificial forces. Nor is it advisable to laterally expand arches to a width that is more than relatively normal, with the frequent production of an unnatural exposure of back teeth at every movement of the risorius muscles, that are sometimes seen from the hands of dentists who believe that extraction is never demanded nor required. To assert this, is to deny the influences of admixture of the types of different nations and races, which, through the laws of inheritance and variation, have produced the great variety of physical forms that especially are found in America where these causes have had full sway.

Classification. In regard to my classification, I can see no objection—in fact only good—in dividing irregularities of the teeth into as many classes as there are distinctive recurring irregularities that differ in their principal characteristics and demands of treatment from other recurring irregularities.

This question must surely resolve itself and be guided to its solution by actual conditions that we meet. If these actual conditions become familiar as distinct varieties of irregularities which differ from each other both as to character of inharmony that they produce, and the treatment demanded for their correction, it must certainly constitute a class according to every scientific law of classification. When dentists are able to recognize these different distinct varieties by the special inharmony or deformity which they produce, and when we are able to instill them into the minds of our students, they will then—and not till then—be able to outline and follow the proper course of treatment which the case demands for its most perfect correction.

Dr. Guilford. I think what Dr. Hofheinz meant to ask was, whether in teaching orthodontia we taught the different methods advocated by different men. For myself I can answer. We have had many systems that have become so entirely obsolete that they are matters of history only, although some of them possessed certain virtues, and in my teaching I always refer to this fact.

With regard to the appliances: If a student knows how to draw a wire, how to make tubing and how to make a nut, he has all the requirements that he needs if he knows what he wants to construct. Those are the fundamental things he must know. He must also know what to do in certain cases, and to learn this he must have, in addition to the didactic teaching, clinical instruction. Students bring me cases for examination, and I have them make models and present them to me. That gives them practice in making models. Then I look over the model with them and ask what they would do in that particular case. After I have their opinion I tell them that this requires work of a certain character which can be done in this way or that way or some other way. Now, what plan shall we pursue? I discuss the various methods that I have outlined, stating the advantages and disadvantages of each, until I finally decide on what ought to be done. Then I tell them to go ahead, make the appliances and treat that particular case. I do not think that much stress should be laid on the teaching of systems because the tools and appliances we use are as old as the hills and do not belong to anyone. They are the foundation of the devices which we wish to construct, and if the student knows how to make them, and what course of treatment to pursue, there ought to be no very great difficulty about the matter.

The Cost of the Congress.

There is every prospect that the International Dental Congress at St. Louis will be a great scientific success. The programmes already arranged by the various section committees make this assured. There is likewise a reasonable certainty that the great gathering will be successfully financed; but this is not sufficient. There should be absolutely no doubt on this point. The honor of American dentistry and of American dentists demand that at the termination of the Congress, all visitors shall have been hospitably and generously treated in consonance with the reputation of the great American people in all past events where foreigners have been invited to our shores, and it is a prerequisite that every proper bill shall have been paid in full when the executive committee terminates its laborious duties.

Money has been contributed thus far with great liberality, yet more might have been expected. The true facts in the case, the true needs, have not been fully comprehended. At the recent meeting of the Northern Ohio Dental Society, Dr. Butler, the chairman of the Finance Committee, made certain explanations and statements which might well have been published earlier. They are here recorded that the last excuse may be snatched from

those who hesitate to join the Congress or to contribute to the expense thereof, for be it understood that we conceive it to be the duty of every American dentist to join the Congress even though he may not be able to attend. As samples of the excuses that have been given for not joining, it has been said: "I cannot see why they need $35,000," or "Why should I pay ten dollars when I can attend for nothing; I do not want the transactions," or, in lower tones, "I do not purpose to give that committee my money to help them entertain their personal foreign friends."

Whispers of this kind, unanswered, have done much to cause those who have heard them to, at least, "wait awhile." For this reason they were repeated to Dr. Butler, with the request that he silence them by making reply, which he did to the complete satisfaction of the four hundred and fifty men in attendance at this great Ohio meeting.

In the first place Dr. Butler explained that as well as can be estimated at this time, the transactions will contain about two thousand pages, and the best figures obtainable for printing, binding and distributing the same amounts to just eight dollars per set. Thus each member paying ten dollars, will, besides other privileges receive a copy of the transactions which will actually cost eight dollars. This leaves but two dollars out of each membership fee, for the legitimate expenses of the meeting. The committees preparing and arranging the Congress are giving their time and services gratis, but they necessarily incur expenses properly chargeable to the Congress. For example one member has been absent from his office for twenty-one whole days, and has traveled over ten thousand miles attending meetings and working for the Congress. The printing of circular letters alone, which have been widely distributed throughout the world, makes a sum that the thoughtless or inexperienced would scarcely conceive. Whilst it would be impossible and out of place here to endeavor to enumerate all the natural channels in which money must be expended in order to make the Congress successful, Dr. Butler declared that the Committee of Arrangements have promised that a full itemized account of all receipts and disbursements will be published in the dental journals at the end of the Congress.Thus all will know then, what the character and reputations of the members of the committee make certain in advance, that the funds will be wisely and appropriately used.

To those who imagine that they may attend the Congress without pay-

ing the membership fee, Dr. Butler conveys the intelligence that absolutely none but members will be admitted to meetings, lecture halls, or clinics controlled by the Congress.

In regard to entertainment of foreign guests, excursions, banquets, visits to the fair, etc., etc., it has been planned that all partaking of the same will pay pro rata, and that not one dollar of the Congress funds will be diverted to any such purpose.

After these positive assertions from Dr. Butler, it is to be hoped that the "waiters" will no longer wait, but promptly forward their membership fees to the chairmen of their several State Committees.

If by an chance or mischance, there should be a deficit at the end of this Congress, it will be a lasting disgrace to American dentists, and while already the receipts make such a disaster practically impossible, the last vestige of doubt should be removed, and the arduous work of the committee rewarded by a prompt and immediate contribution.

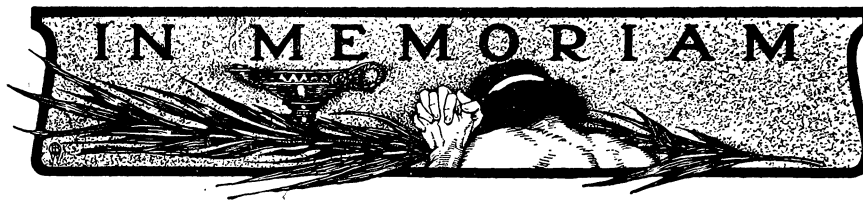
Moral: After reading the above, turn to your check book and mail your ten dollars.

Patent Bill Indorsed.

At the recent meeting of the American Dental Trade Association, the following resolution was unanimously adopted:

Whereas in the estimation of our association which is composed of the representative manufacturers of and dealers in dental supplies in the United States, the amendment to Patent Laws introduced in Senate bill No. 4256, House bill No. 6771, will remove a class of patents which have long caused annoyance to the dental profession.

Therefore, be it resolved that the American Dental Trade Association heartily endorses the amendment and urges favorable action thereon, and that the secretary be instructed to notify the committees having the amendment in consideration of such action.



Dr. I. P. Wilson.

Resolution passed by the Iowa State Dental Society.

Report of Comm. on Dr. I. P. Wilson, deceased.

Your committee would report as follows:

Whereas, since the last meeting of this society, death removed from us on the 9th day of March, 1904, one of our most honored and esteemed members, Dr. I. P. Wilson, of Burlington, we, as members of this society, wish to give this expression as to his worth and character, and to the esteem in which he was held by this society and the profession of the State.

Dr. Wilson was an Iowa dentist, having come to the State from Ohio when about fifteen years of age, studied dentistry with Dr. Tullus, of Iowa City, and later graduated from the Missouri Dental College. He spent the whole of his professional life in Iowa, the greater part of which was in Burlington. For forty-one years he was a member of this society, being prominently connected with its early history.

Dr. Wilson was devoted to his profession, never being satisfied with present attainments, but constantly pressing forward, keeping abreast with the advance made by the profession. He always regarded this society as indispensable to his advancement.

As an instructor in the Dental Department, S. U. I., and later in the Keokuk Dental College, he endeared himself to the hearts of the students. He was pre-eminently the friend of the young men of the profession, and his influence was that of an honest, upright, professional Christian gentleman.

Therefore, Resolved, That this society hereby testify to the loss we experience in the death of Dr. Wilson, and extend our sincere sympathy to Mrs. Wilson and the family in their bereavement; that these resolutions be spread upon the records of this society; that a copy be sent to Mrs. Wilson and the family; also the dental journals for publication.

J. B. Monfort,
A. W. Dana,
Anna H. Joy, Committee.

SOCIETY ANNOUNCEMENTS

National Society Meetings.

National Association of Dental Examiners, St. Louis, Aug. 25, 26, 27.

Fourth International Dental Congress, August 29 to Sept. 3, 1904.

State Society Meetings.

Delaware State Dental Society, Oct. 5.
Illinois State Dental Society, Moline, May 9, 10, 11, 1905.
Maine Dental Society, Bangor, July 19, 20, 21.
Montana State Dental Society, Butte, Feb. 20-21, 1905.
New Jersey State Dental Society, Asbury Park, July 21, 22, 23.
Pennsylvania State Dental Society, Wilkesbarre, July 12, 13, 14.
South Carolina State Dental Society, White Stone, July 19-22.
Wisconsin State Dental Society, July 19-21.

Fourth International Dental Congress.

St. Louis, Mo. August 29 to September 3, 1904.

Official Train.

Official through train consisting of sleepers, dining car, observation car and buffet, library, smoking car, will leave New York City via New York Central Railway, Saturday, August 27, at 10 a. m., passing Albany 1:15 p. m., connecting with trains from Boston and New England; passing

Syracuse 6 p. m., Rochester, 7:42 p. m., arriving Buffalo 9 p. m., leaving Buffalo (via Lake Shore Railway) 9:20 p. m., passing Cleveland 12:20, night, thence via Big Four Railroad arriving in St. Louis about noon Sunday, August 28th.

Round trip ticket, 15 day limit, from New York, returning from St. Louis either direct or via Chicago and Alton Railway to Chicago, and Lake Shore Railway, with stop over at Chicago and Niagara Falls, $26.25. Sixty-day limit $32.25. These rates are exclusive of sleeping car.

Members living in vicinity of New York, will join official train at New York City, and those from Philadelphia and vicinity at Buffalo. Same rates and accommodations can be secured via the Lehigh Valley Railway to Buffalo thence to St. Louis from Philadelphia and vicinity as via any other direct line.

For information regarding reservation of berths, tickets, etc., from New York, Philadelphia, New Jersey and New England, apply at once to Dr. W. C. Deane, 114 East 60th street, New York City. From Western New York and Canada, to Dr. F. E. Howard, 331 Franklin Street, Buffalo, N. Y.

For the accommodation of those in the party, hotel reservations in St. Louis should be made at the Jefferson Hotel, headquarters of the Congress, not later than August 1, either direct or through Dr. D. O. M. LeCron, Missouri Trust Building, St. Louis, Mo.

Fraternally,

W. C. DEANE,

114 East 60th Street, New York City.

Fourth International Dental Congress Banquet.

The Fourth International Dental Congress banquet will be held on the first of September at 8 p. m. in the Coliseum adjoining the Congress Hall. The price per plate is $3. It is requested that all who expect to attend send their names and money to Dr. A. H. Fuller, P. O. Box, 604, St. Louis, Mo., at once, and not later than August 20th. Arrangements to pay can be made with Dr. A. H. Fuller at the time of registration, provided notice is given before August 20th.

G. A. BOWMAN,

A. H. FULLER,

ADAM FLICKINGER, Banquet Committee.

ITEMS OF INTEREST

Federation Dentaire Internationale.

The next (fourth annual) meeting will be held in the Coliseum Building, St. Louis, Mo., August 26th and 27th. The first session will convene under the presidency of Dr. Charles Godon, at 11 a. m. There will be a meeting of the Executive Council on Thursday (the 25th), at the Hotel Jefferson, at 10 a. m. The section on education will meet at 3 p. m., Friday. The section on hygiene and public dental service will meet at 3 p. m., Friday. The section on International Dental Press will meet at 4:30 p. m., Friday.

The officers of the sections are:

Education: President, Dr. T. W. Brophy; vice-presidents, Dr. E. C. Kirk, Dr. W. B. Paterson and Dr. O. Zsigmondy; secretaries, Dr. M. Roy and Dr. R. B. Weiser.

Hygiene and Public Dental Service: President, Dr. W. D. Miller; vice-presidents, Dr. Cunningham, Dr. Forberg, Dr. Jenkins and Dr. Rose; secretaries, Dr. R. Heide, Dr. Sauvez and Dr. R. B. Weiser.

Commission on International Dental Press: President, Dr. E. Forberg; vice-president, Dr. A. W. Harlan; secretary, Dr. E. Papot.

Executive Council: President, Dr. Charles Godon; vice-presidents, Dr. A. W. Harlan, Dr. W. D. Miller; secretary, Dr. E. Sauvez; treasurer, Dr. F. Aguilar.

Members: Dr. George Cunningham, Dr. E. Forberg, Dr. R. B. Weiser, Dr. J. E. Greevers, Dr. F. Hesse, Dr. Klingelhofer.

On behalf of the federation.

A. W. HARLAN, Vice-President.

1122 Broadway, New York City, June 16, 1904.

New Jersey State Dental Society.

The thirty-fourth annual session of the New Jersey State Dental Society will convene in the Auditorium, Asbury Park, N. J., 10 a. m., Wednesday, July 21, and continue in session Thursday and Friday. Asbury Park is one of the great Atlantic Coast watering places contiguous to New York and Philadelphia. The Auditorium will hold 3,000 people, and is open on every side. Fifty clinics will be given by men from North, South, East and West most eminent in their profession, and will include the newest advances in all that pertains to operative and mechanical dentistry. In the exhibits the Society feels that the latest and largest number of adjuncts to the successful practice of modern dentistry will

repay a visit and inspection. The essays will consist of five already accepted and the best obtainable.

The social members and the visiting friends will be as usual provided for, and on Thursday evening at 10:30 a smoker will be conducted. The Columbia Hotel will be headquarters, with rates of $2.50 to $3 per day. Those desiring rooms must send in notice by July 1. The programme as usual will be replete with information.

CHARLES A. MEEKER, D.D.S., Sec'y.

29 Fulton Street, Newark, N. J.

Delta Sigma Delta Fraternity, Supreme Chapter.

The twentieth annual meeting of the Supreme Chapter, Delta Sigma Delta Fraternity will be held Wednesday, August 31, 1904, at St. Louis, Mo. George E. Hunt, 131 East Ohio Street, Indianapolis, is Chairman of the Committee on Arrangements.

Maine Dental Society.

The thirty-ninth annual meeting of the Maine Dental Society will be held in Bangor, July 19, 20 and 21, 1904. All ethical dentists are cordially invited to attend, and we especially invite natives who are practicing out of the State to meet with us and make this a "home week." We expect men of national reputation to give clinics and read papers. Reduced rates will be given on transportation and at hotels.

Castine, Me. WILL S. PAYSON, Chairman Executive Committee.

Pennsylvania State Dental Society.

The thirty-sixth annual meeting of the Society will be held at the Hotel Sterling, Wilkesbarre, Pa., on Tuesday, Wednesday and Thursday, July 12, 13 and 14. The convention will be called to order at 10 a. m., Tuesday, July 12. Every effort has been made to make this the most interesting and useful meeting of our Society. The Executive Committee promises a very full programme, including among its essayists Dr. B. Holly Smith, of Baltimore; Dr. M. H. Cryer and Dr. E. C. Kirk, of Philadelphia; Dr. Gordon White, of Nashville, and Dr. Anema, of the Netherlands. Besides these a number of prominent clinicians demonstrating some specialty in dentistry have volunteered to give their time

and skill for the good of the profession and to make this meeting a successful one. All reputable men of the profession are cordially invited to attend.

G. W. CUPIT, Sec'y.

1420 Chestnut Street, Philadelphia, Pa.

Wisconsin State Dental Society.

The thirty-fourth annual meeting of the Wisconsin State Dental Society will be held in Manitowoc July 19-21, 1904. A cordial invitation is extended to all ethical practitioners to meet with us.

A. G. FEE, President.
W. H. MUELLER, Sec'y.

Madison, Wis.

South Carolina State Dental Society.

The thirty-fourth annual meeting of the South Carolina State Dental Society will be held at White Stone Lithia Springs, White Stone, S. C., July 19, 20, 21, 22. We anticipate a pleasant as well as a profitable meeting and a cordial invitation is extended to all.

Northern Iowa Dental Society.

The Northern Iowa Dental Society will meet at Waterloo, on July 26, 27, and 28. The date has been changed owing to the fact of the Dental Congress being held at that time at St. Louis. An interesting programme is being prepared. Every member is earnestly requested to be present.

Decorah, Iowa. C. L. TOPLIFF, Sec'y.

The National Association of Dental Examiners.

The National Association of Dental Examiners will hold their annual meeting in the Coliseum Building, corner Thirteenth and Olive Streets, St. Louis, Mo., on the 25th, 26th and 27th of August, beginning promptly at 10 a. m. Telephone and telegraph offices in the building.

The committee on railroad accommodations for the East have made arrangements for fast through Pullman service to St. Louis from

New York with the Delaware & Lackawanna Railroad. Two special Pullman cars will leave New York Tuesday, August 23d, at 10 a. m. The cost of our excursion, including berth each way, will be $35.50. A proportionate reduction is made for those going from Buffalo, Toledo, Fort Wayne and cities on the line connecting with the Wabash Railroad. Those who desire to go in the special train should send notice as promptly as possible to Charles A. Meeker, D. D. S., Secretary of the National Association or to Guy Adams, general passenger agent of the Delaware & Lackawanna Railroad.

Accommodations have been secured for the National Association of Dental Examiners at the Franklin Hotel, Northwest corner of Sarah and Westminster Place, with rates from $1.50 to $6.00 per day, European plan. Hotel first class. Secure rooms by writing to E. C. Dunnavant, St. Louis Service Co., Seventh and Olive Streets, St. Louis, Mo. CHARLES A. MEEKER, D.D.S., Sec'y.

Vermont Board of Dental Examiners.

The Vermont Board of Dental Examiners will meet at Montpelier on Tuesday, July 5, 1904, at two o'clock p. m. for the examination of candidates to practice dentistry.

Headquarters at the Pavilion Hotel.

Application blanks, together with rules and instructions to candidates, can be had on application to the Secretary. Application, with the fee, $10, must be filed on or before June 27, 1904. GEO. F. CHENEY, Sec'y.

St. Johnsbury, Vt.

New Jersey State Board of Registration and Examination in Dentistry.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the theoretical branches in the assembly room of the State House at Trenton, N. J., on July 5, 6 and 7. Sessions begin promptly at 9 a. m.

The practical prosthetic and practical operative work will be done in Newark. All applications must be in the hands of the secretary ten days prior to the examination. For further information apply to the secretary.

CHARLES A. MEEKER, D.D.S.,
Fulton Street, Newark, N. J.

Dental Commissioners of Connecticut.

The Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford on Thursday, Friday and Saturday, July 14, 15, 16, 1904, respectively, to examine applicants for license to practice dentistry, and for the transaction of any other proper business.

The practical examination in operative and prosthetic dentistry will be held Thursday, July 14, at 9 a. m., in Putnam Phalanx Armory, corner Haynes and Pearl Streets.

The written theoretic examination will be held Friday and Saturday, July 15 and 16, at the Capitol.

All applicants should apply to the Recorder for proper blanks and for the revised rules for conducting the examinations.

Application blanks must be carefully filled in and sworn to, and with fee, $25, filed with the Recorder on or before July 7, 1904.

By direction of the Dental Commissioners

Wallingford, Conn. J. TENNEY BARKER, Recorder.

N. B.—Examination fee must be forwarded by money order or certified check. Enclose stamp.

South Carolina State Board of Dental Examiners.

The South Carolina State Board of Dental Examiners will meet at White Stone Lithia Springs on July 15. All candidates for certificates will govern themselves accordingly.

Leesville, S. C. E. J. ETHEREDGE, Sec'y.

The Warren, Pennsylvania, Dental Association.

The dentists of Warren, Pa., have formed a dental society to be known as the Warren, Pennsylvania, Dental Association. The membership is open to practitioners in good standing. Meetings are held the fourth Monday in each month, at which dental topics are discussed and light refreshments served. All members have agreed to close their offices at 12 o'clock Saturdays from the first Saturday in April to the last Saturday in November. The officers for the year are: Dr. J. T. Danforth, president; Dr. W. H. McAlpin, vice-president; Dr. E. C. Thompson, secretary and treasurer. E. C. THOMPSON, Sec'y.